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既 刊 資 料

TM-630	Sic/AI複合材の曲げ破壊による AE	1990年12月	祖父江 靖, 小河 昭紀
TM-631	高圧液酸ターボポンプ試験設備タービン駆動系 Turbine Drive System of the High Pressure LOX Turbopump Test Facility	1991年1月	渡辺 義明, 長谷川 敏 上條謙二郎, 橋本 亮平 坂本雄二郎, 戸根 重幸
TM-632	超音速二次元翼列風洞用空気エゼクターの実験 (第一報・二次流量が零の場合の性能) Air Ejector Experiments Using the Two- Dimensional Supersonic-Cascade Tunnel (1st Report, Zero-Secondary-Flow Per- formance)	1991年2月	高森 晋, 坂口 一
TM-633	低騒音STOL実験機用HUD(ヘッド・アップ・ ディスプレイ)の第二次シミュレーション評価 試験 The Second Flight Simulator Test of the Head-Up Display for NAL QSTOL Experi- mental Aircraft (ASKA)	1991年2月	STOL プロジェクト推進本部 機体技術開発室・操縦システ ム開発チーム 飛行試験室・飛行解析チーム
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TM-636	クオータニオンとオイラー角によるキネマティッ クス表現の比較について Quaternion and Euler Angles in Kinematics	1991年6月	山口 功, 木田 隆 岡本 修, 狼 嘉彰
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NACA0012 Airfoil Data Corrected for Sidewall Boundary-Layer Effects in the NAL Two-Dimensional Transonic Wind Tunnel*

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ABSTRACT

An experimental study on NACA0012 airfoils at transonic speeds has been conducted in order to acquire aerodynamic data for evaluating sidewall boundary-layer effects. Measurements primarily consisted of static pressure on the airfoil and drag force coefficients determined using the wake rake. The tests were performed at free-stream Mach numbers from approximately 0.65 to 0.8, at angles of attack from -2.0° to 2.0° , and at Reynolds numbers (based on airfoil chord) from 7×10^6 to 40×10^6 . Mach number corrections for sidewall boundary-layer effects were made, and tests were subsequently performed on two different chord airfoils to confirm the applicability of the correction to different airfoil aspect ratios. This is a supplementary report and presents both uncorrected and corrected data which enables comparative studies to be conducted using computational fluid dynamics and other wind tunnel experimental results.

Keywords: Airfoil Data, Transonic Flow, NACA0012, Wind Tunnel Test, Sidewall Correction

概要

航空宇宙技術研究所二次元風洞の側壁境界層の影響を評価する目的で遷音速域においてNACA0012翼型に関する実験を行った。測定項目は翼表面圧力分布測定、後流トラバースによる抵抗測定の二項目である。マッハ数は約0.65から0.8、迎角は -2° から 2° 、翼弦長を基準とするレイノルズ数は 7×10^6 から 40×10^6 の範囲で試験を行った。本実験結果に側壁干渉によるマッハ数修正を施し、修正法に検討を加えるとともに、さらに翼弦長の異なる模型についても実験を行いアスペクト比の変化に対する本修正法の適用性の確認も行った。本報告では他風洞及びCFDとの比較研究のための資料として修正前及び修正後の結果を併せて紹介する。

本報告は、航空宇宙技術研究所報告TR-1109Tを補足するためのデータ集である。

Nomenclature

AR : aspect ratio ($= b/c$)
 b : width of the tunnel, span of the airfoil

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c : airfoil chord
 $C_{d_{wake}}$: drag coefficient measured by the wake rake
 C'_d : value defined as Equation (1)
 C_{l_c} : corrected lift coefficient
 C_{l_u} : uncorrected lift coefficient

C_p	: pressure coefficient
$C_{p,c}$: corrected pressure coefficient
C_p^*	: critical pressure coefficient
l_1	: distance (see Figure 3)
l_2	: distance (see Figure 3)
M_c	: corrected Mach number
M_s	: setting Mach number (uncorrected)
Re	: Reynolds number based on the airfoil chord
x	: streamwise coordinate
z	: normal coordinate
α_s	: setting angle of attack (uncorrected)

subscripts

c	: corrected value
s	: setting value
u	: uncorrected value

1. Introduction

Recently, concern about wind tunnel wall interference effects at transonic speeds have increased with emphasis on the need for reliable two-dimensional experimental data. In the NAL Two-Dimensional Transonic Wind Tunnel (2D-TWT), tests on NACA0012 airfoil models were conducted in order to evaluate the effects of the sidewall boundary-layer. Analysis and discussion of these tests are given in Reference 1 in detail.

The objective of this report is to document the results of these tests in order to provide the data for the comparative study with CFD (see, for example, Reference 2) and other wind tunnels (see, for example, References 3, 4, and 5) for evaluating sidewall boundary-layer effects and improving the accuracy of the measurements. This report is a collection of the measured and corrected data, and supplements the analysis and discussion given in Reference 1. Consequently, results are presented without discussion.

2. Apparatus and Techniques

Wind Tunnel

The tests were conducted in the NAL Two-Dimensional Transonic Wind Tunnel. The wind tunnel is of the blowdown type operating at Reynolds number based on the airfoil chord length (250 mm) from 7×10^6 to 40×10^6 according to the variation of the stagnation pressure.⁶ Figure 1 shows a test section schematic of the wind tunnel. The size is 0.3 m wide x 1 m high. The top and bottom walls each have four full slots and two half-slots at the sides. The total slot width at the position of the model is 3 percent of the width of the upper and lower walls. The sidewalls of the test section are solid (not rigimeshes) with no sidewall removal system activated in this investigation.

Models

Sketches of the NACA0012 airfoil models and pressure orifice layout are illustrated in Figure 2(a) and 2(b). The models have chords of 250 mm and 150 mm, and span the width of the tunnel (300 mm) with aspect ratios (span-to-chord ratios) of 1.2 and 2.0, respectively.

The models were constructed of stainless steel. The design and measured (near the position where the pressure orifices located) section coordinates are given in Tables 1 to 4. The deviations between design and measured coordinates are small, never exceeding $|\Delta z/c| = 0.00029$ for the 250 mm chord model and $|\Delta z/c| = 0.00042$ for the 150 mm. These small deviations are expected not to noticeably affect the results. The static pressure orifices are 0.5 mm in diameter and located as near as possible to the airfoil midspan. Both the models have 47 pressure orifices on the upper surface and 22 orifices on the lower surface.

Surface Pressure Measurements

Surface pressures were measured with Scani-valve units with a transducer range of 689 kN/m². Accuracy of the transducers was within 0.1-

percent of full scale. Those valves and pressure transducers were placed in the plenum chamber near the model to keep the lag time due to pressure leads small. Pressure signals from the transducers were referenced to the plenum chamber pressure.

Wake Rake

The airfoil drag force coefficient was determined from the total and static pressures measured across the wake by use of a rake. The rake had a static-pressure tube and two total-pressure tubes, the latter two with a side-by-side arrangement to ascertain the two-dimensionality of the wake. The static tube was located 20 mm to the left of the tunnel midspan ($z/(b/2) = -0.133$), and the total tubes were located 30 mm and 50 mm to the right ($z/(b/2) = 0.2$ and 0.533, respectively). The total tubes had an outside diameter of 1.0 mm and an inside diameter of 0.8 mm. The rake was positioned such that the upstream end of the tubes were at a distance of about 500 mm behind the trailing edges of the respective airfoil models.

Data Reduction

Section lift coefficients were calculated from normal-force and drag coefficients. The normal force coefficients were obtained by numerical integration (based on the trapezoidal method) of the local surface-pressure coefficient measured at each orifice multiplied by an appropriate weighting factor (incremental area), and the drag coefficients were determined by the wake rake.

Section drag coefficients were obtained by numerical integration across the wake, using the procedure of Reference 6. The integration is performed between upper and lower limits according to Reference 7. The definition of the integration limits is shown in Figure 3. The C'_d value is defined as

$$C_{d_{\text{wake}}} = \int C'_d d(z/c) \quad (1)$$

The first stage is to detect the positions in the wake where the C'_d value falls below a test cut-off level ($C'_d = 0.005$), and to calculate distances

between these positions and the peak pressure deficit location (l_1 and l_2). The second stage is the extension of these two distances by a specified percentage (50%), and the final integration limits are determined. This method improves the repeatability and the accuracy of the drag measurement drastically compared with the traditional method⁶ which was used in the NAL 2D-TWT.

Sidewall Correction

The present data were corrected by the Murthy method⁸ for sidewall boundary-layer effects on test section Mach number. This method is based on the wavy flow model by considering the compressible flow between a straight wall and a wavy wall so that it includes the effects of the model aspect ratio. Applying this method to the present data gave a good agreement with the CFD data and other wind tunnel's data on the aerodynamic characteristics of the NACA0012 airfoil (See Reference 1).

3. Test Conditions

The tests were conducted at Mach numbers from approximately 0.65 to 0.8, at angles of attack from -2.0° to 2.0° , and at Reynolds numbers based on the airfoil chord from 7×10^6 to 40×10^6 . No attempt was made to fix the transition. These test conditions were shown in Tables 5 and 6, and in Figures 4 to 8.

4. Presentation of Data

Tables 5 and 6 summarize the test conditions and the derived force coefficients while Figure 9 to 58 give the corresponding surface pressure data in plotted as well as tabular forms. As to the free-stream Mach number, pressure coefficient, and lift coefficient, both uncorrected and corrected values for only sidewall effects by the Murthy method are presented. As to the Reynolds number and drag force coefficient, however, only uncorrected values are presented for reasons that the correction

values for Reynolds number are negligibly small, and that this correction applies only to the component of pressure drag in the drag coefficient so that it is difficult to estimate the correction values. Also as to the angle of attack, uncorrected (setting) values are presented because of difficulty in estimating the correction values.

In Figures 59 to 68, the lift coefficients (corrected) are plotted versus the drag force coefficients for a wide range of Mach numbers and Reynolds numbers as summed up in Table 7.

In addition to the airfoil surface pressures, static pressure distributions on the top and bottom walls were measured with rails to enable a quantitative evaluation of wall interference effect.⁹⁾ In this paper, however, these data were not used in processing the data because the values of the correction to Mach number for top and bottom walls were negligibly small compared to the correction due to the sidewall boundary-layer (the correction values are about 0.002 or less). An example of the wall pressure data at zero angle of attack (zero lift) is shown in Figure 69 and one in lifting condition is shown in Figure 70 for the sake of illustrations.

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Table 1. Section coordinates of NACA0012 airfoil
[$c = 250$ mm ($AR = 1.2$), upper surface].

x/c	z/c		
	Design	Measured	$\Delta(z/c)$
.0001	.00177	.00206	.00029
.0002	.00250	.00276	.00026
.0004	.00353	.00378	.00025
.0006	.00432	.00452	.00020
.0008	.00498	.00517	.00019
.0012	.00608	.00624	.00016
.0016	.00700	.00713	.00013
.0024	.00854	.00876	.00022
.0032	.00983	.00995	.00012
.0040	.01096	.01107	.00011
.0060	.01334	.01345	.00011
.0080	.01532	.01541	.00009
.0100	.01704	.01713	.00009
.0200	.02360	.02368	.00008
.0400	.03228	.03236	.00008
.0600	.03838	.03846	.00008
.0800	.04307	.04316	.00009
.1000	.04683	.04692	.00009
.1200	.04988	.04995	.00007
.1400	.05238	.05246	.00008
.1600	.05442	.05450	.00008
.1800	.05607	.05616	.00009
.2000	.05738	.05748	.00010
.2200	.05839	.05848	.00009
.2400	.05913	.05921	.00008
.2600	.05964	.05971	.00007
.2800	.05992	.05999	.00007
.3000	.06002	.06009	.00007
.3200	.05993	.05999	.00006
.3400	.05967	.05974	.00007
.3600	.05926	.05933	.00007
.3800	.05871	.05878	.00007
.4000	.05803	.05809	.00006
.4200	.05722	.05728	.00006
.4400	.05631	.05636	.00005
.4600	.05528	.05533	.00005
.4800	.05416	.05420	.00004
.5000	.05294	.05298	.00004
.5200	.05164	.05167	.00003
.5400	.05025	.05029	.00004

x/c	z/c		
	Design	Measured	$\Delta(z/c)$
.5600	.04878	.04882	.00004
.5800	.04724	.04727	.00003
.6000	.04563	.04567	.00004
.6200	.04396	.04398	.00002
.6400	.04222	.04225	.00003
.6600	.04042	.04044	.00002
.6800	.03856	.03860	.00004
.7000	.03664	.03667	.00003
.7200	.03466	.03469	.00003
.7400	.03264	.03266	.00002
.7600	.03056	.03057	.00001
.7800	.02842	.02844	.00002
.8000	.02623	.02625	.00002
.8200	.02399	.02400	.00001
.8400	.02169	.02170	.00001
.8600	.01934	.01932	-.00002
.8800	.01694	.01690	-.00004
.9000	.01448	.01443	-.00005
.9200	.01196	.01192	-.00004
.9400	.00938	.00935	-.00003
.9600	.00674	.00676	.00002
.9800	.00403	.00413	.00010
1.0000	.00126	.00138	.00012

Table 2. Section coordinates of NACA0012 airfoil
[$c = 250$ mm (AR = 1.2), lower surface].

x/c	z/c		$\Delta(z/c)$
	Design	Measured	
.0001	-.00177	-.00202	-.00025
.0002	-.00250	-.00268	-.00018
.0004	-.00353	-.00373	-.00020
.0006	-.00432	-.00449	-.00017
.0008	-.00498	-.00515	-.00017
.0012	-.00608	-.00622	-.00014
.0016	-.00700	-.00717	-.00017
.0024	-.00854	-.00872	-.00018
.0032	-.00983	-.00998	-.00015
.0040	-.01096	-.01108	-.00012
.0060	-.01334	-.01344	-.00010
.0080	-.01532	-.01542	-.00010
.0100	-.01704	-.01712	-.00008
.0200	-.02360	-.02364	-.00004
.0400	-.03228	-.03233	-.00005
.0600	-.03838	-.03843	-.00005
.0800	-.04307	-.04313	-.00006
.1000	-.04683	-.04689	-.00006
.1200	-.04988	-.04996	-.00008
.1400	-.05238	-.05247	-.00009
.1600	-.05442	-.05452	-.00010
.1800	-.05607	-.05617	-.00010
.2000	-.05738	-.05748	-.00010
.2200	-.05839	-.05849	-.00010
.2400	-.05913	-.05923	-.00010
.2600	-.05964	-.05973	-.00009
.2800	-.05992	-.06002	-.00010
.3000	-.06002	-.06011	-.00009
.3200	-.05993	-.06001	-.00008
.3400	-.05967	-.05977	-.00010
.3600	-.05926	-.05934	-.00008
.3800	-.05871	-.05879	-.00008
.4000	-.05803	-.05810	-.00007
.4200	-.05722	-.05729	-.00007
.4400	-.05631	-.05636	-.00005
.4600	-.05528	-.05534	-.00006
.4800	-.05416	-.05422	-.00006
.5000	-.05294	-.05300	-.00006
.5200	-.05164	-.05169	-.00005
.5400	-.05025	-.05030	-.00005

x/c	z/c		$\Delta(z/c)$
	Design	Measured	
.5600	-.04878	-.04883	-.00005
.5800	-.04724	-.04729	-.00005
.6000	-.04563	-.04568	-.00005
.6200	-.04396	-.04401	-.00005
.6400	-.04222	-.04227	-.00005
.6600	-.04042	-.04046	-.00004
.6800	-.03856	-.03860	-.00004
.7000	-.03664	-.03667	-.00003
.7200	-.03466	-.03468	-.00002
.7400	-.03264	-.03264	.00000
.7600	-.03056	-.03054	.00002
.7800	-.02842	-.02841	.00001
.8000	-.02623	-.02620	.00003
.8200	-.02399	-.02397	.00002
.8400	-.02169	-.02169	.00000
.8600	-.01934	-.01935	-.00001
.8800	-.01694	-.01696	-.00002
.9000	-.01448	-.01450	-.00002
.9200	-.01196	-.01198	-.00002
.9400	-.00938	-.00940	-.00002
.9600	-.00674	-.00678	.00004
.9800	-.00403	-.00414	.00011
1.0000	-.00126	-.00140	.00014

Table 3. Section coordinates of NACA0012 airfoil
[$c = 150$ mm ($AR = 2.0$), upper surface].

x/c	z/c		$\Delta(z/c)$
	Design	Measured	
.0001	.00177	.00219	.00042
.0002	.00250	.00283	.00033
.0003	.00307	.00337	.00030
.0004	.00353	.00388	.00035
.0006	.00431	.00465	.00034
.0008	.00497	.00531	.00034
.0010	.00555	.00585	.00030
.0012	.00608	.00633	.00025
.0014	.00656	.00680	.00024
.0016	.00700	.00725	.00025
.0018	.00742	.00763	.00021
.0020	.00781	.00803	.00022
.0024	.00854	.00877	.00023
.0028	.00921	.00943	.00022
.0032	.00983	.01001	.00018
.0036	.01041	.01061	.00020
.0042	.01122	.01136	.00014
.0048	.01197	.01214	.00017
.0058	.01312	.01326	.00014
.0064	.01376	.01389	.00013
.0074	.01475	.01488	.00013
.0087	.01594	.01602	.00008
.0100	.01703	.01714	.00011
.0150	.02063	.02069	.00006
.0200	.02360	.02363	.00003
.0250	.02615	.02619	.00004
.0300	.02840	.02845	.00005
.0400	.03227	.03235	.00008
.0450	.03397	.03405	.00008
.0500	.03555	.03562	.00007
.0550	.03701	.03707	.00006
.0600	.03837	.03839	.00002
.0650	.03965	.03970	.00005
.0700	.04086	.04090	.00004
.0750	.04200	.04206	.00006
.0800	.04307	.04315	.00008
.0900	.04505	.04513	.00008
.1000	.04683	.04691	.00008
.1100	.04843	.04851	.00008
.1200	.04988	.04993	.00005

x/c	z/c		$\Delta(z/c)$
	Design	Measured	
.1400	.05238	.05243	.00005
.1600	.05441	.05445	.00004
.1900	.05676	.05677	.00001
.2200	.05839	.05839	.00000
.2400	.05913	.05915	.00002
.2700	.05981	.05983	.00002
.3000	.06001	.06005	.00004
.3300	.05982	.05985	.00003
.3600	.05926	.05929	.00003
.3900	.05839	.05841	.00002
.4200	.05722	.05724	.00002
.4500	.05581	.05582	.00001
.4800	.05415	.05414	-0.00001
.5100	.05229	.05229	.00000
.5400	.05025	.05025	.00000
.5700	.04802	.04803	.00001
.6000	.04563	.04562	-0.00001
.6300	.04309	.04308	-0.00001
.6600	.04041	.04041	.00000
.6800	.03855	.03855	.00000
.7000	.03663	.03663	.00000
.7200	.03467	.03466	-0.00001
.7400	.03263	.03262	-0.00001
.7600	.03055	.03054	-0.00001
.7800	.02842	.02839	-0.00003
.8000	.02623	.02621	-0.00002
.8200	.02399	.02397	-0.00002
.8400	.02169	.02168	-0.00001
.8600	.01934	.01933	-0.00001
.8800	.01694	.01691	-0.00003
.9000	.01447	.01443	.00002
.9200	.01195	.01189	.00001
.9400	.00937	.00934	.00003
.9600	.00673	.00674	.00002
.9800	.00403	.00404	.00000
.9900	.00265	.00268	-0.00001
1.0000	.00126	.00123	-0.00002

Table 4. Section coordinates of NACA0012 airfoil
[$c = 150$ mm ($AR = 2.0$), lower surface].

x/c	z/c		$\Delta(z/c)$				
	Design	Measured					
.0001	-.00177	-.00216	-.00039				
.0002	-.00250	-.00287	-.00037				
.0003	-.00307	-.00344	-.00037				
.0004	-.00353	-.00391	-.00038				
.0006	-.00431	-.00465	-.00034				
.0008	-.00497	-.00523	-.00026				
.0010	-.00555	-.00586	-.00031				
.0012	-.00608	-.00637	-.00029				
.0014	-.00656	-.00681	-.00025				
.0016	-.00700	-.00727	-.00027				
.0018	-.00742	-.00769	-.00027				
.0020	-.00781	-.00802	-.00021				
.0024	-.00854	-.00881	-.00027				
.0028	-.00921	-.00951	-.00030				
.0032	-.00983	-.01007	-.00024				
.0036	-.01041	-.01057	-.00016				
.0042	-.01122	-.01137	-.00015				
.0048	-.01197	-.01207	-.00010				
.0058	-.01312	-.01321	-.00009				
.0064	-.01376	-.01385	-.00009				
.0074	-.01475	-.01483	-.00008				
.0087	-.01594	-.01604	-.00010				
.0100	-.01703	-.01713	-.00010				
.0150	-.02063	-.02071	-.00008				
.0200	-.02360	-.02371	-.00011				
.0250	-.02615	-.02622	-.00007				
.0300	-.02840	-.02847	-.00007				
.0400	-.03227	-.03237	-.00010				
.0450	-.03397	-.03402	-.00005				
.0500	-.03555	-.03559	-.00004				
.0550	-.03701	.03705	-.00004				
.0600	-.03837	.03844	-.00007				
.0650	-.03965	.03972	-.00007				
.0700	-.04086	.04092	-.00006				
.0750	-.04200	.04206	-.00006				
.0800	-.04307	.04313	-.00006				
.0900	-.04505	.04509	-.00004				
.1000	-.04683	.04685	-.00002				
.1100	-.04843	.04846	-.00003				
.1200	-.04988	.04992	-.00004				
.1400	-.05238	-.05241	-.00003				
.1600	-.05441	-.05445	-.00004				
.1900	-.05676	-.05677	-.00001				
.2200	-.05839	-.05841	-.00002				
.2400	-.05913	-.05913	.00000				
.2700	-.05981	-.05980	.00001				
.3000	-.06001	-.06001	.00000				
.3300	-.05982	-.05985	-.00003				
.3600	-.05926	-.05929	-.00003				
.3900	-.05839	-.05842	-.00003				
.4200	-.05722	-.05726	-.00004				
.4500	-.05581	-.05584	-.00003				
.4800	-.05415	-.05418	-.00003				
.5100	-.05229	-.05233	-.00004				
.5400	-.05025	-.05025	.00000				
.5700	-.04802	-.04803	-.00001				
.6000	-.04563	-.04564	-.00001				
.6300	-.04309	-.04312	-.00003				
.6600	-.04041	-.04041	.00000				
.6800	-.03855	-.03855	.00000				
.7000	-.03663	-.03661	.00002				
.7200	-.03467	-.03463	-.00004				
.7400	-.03263	-.03260	-.00003				
.7600	-.03055	-.03051	-.00004				
.7800	-.02842	-.02839	-.00003				
.8000	-.02623	-.02621	-.00002				
.8200	-.02399	-.02397	-.00002				
.8400	-.02169	-.02167	-.00002				
.8600	-.01934	-.01933	-.00001				
.8800	-.01694	-.01693	-.00001				
.9000	-.01447	-.01445	.00002				
.9200	-.01195	-.01192	.00003				
.9400	-.00937	-.00935	.00002				
.9600	-.00673	-.00673	.00000				
.9800	-.00403	-.00407	-.00004				
.9900	-.00265	-.00267	-.00002				
1.0000	-.00126	-.00116	.00010				

Table 5. Test condition [$c = 250$ mm ($AR = 1.2$)].

Run	Scan	M_s	M_c	α_s	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$	Figure
6917	1	0.800	0.777	-2.01	7.0×10^6	-0.291	-0.297	0.0185	9
6917	2	0.800	0.777	-1.00	7.0×10^6	-0.145	-0.148	0.0106	10
6916	7	0.800	0.777	0.01	7.0×10^6	0.002	0.002	0.0084	11
6916	2	0.800	0.777	0.51	7.1×10^6	0.069	0.070	0.0089	12
6916	3	0.799	0.776	1.01	7.1×10^6	0.142	0.144	0.0109	13
6916	4	0.799	0.776	1.51	7.1×10^6	0.216	0.220	0.0137	14
6916	5	0.800	0.777	2.01	7.1×10^6	0.295	0.301	0.0185	15
6915	7	0.822	0.799	0.01	7.0×10^6	0.006	0.006	0.0122	16
6915	2	0.822	0.799	0.51	7.0×10^6	0.072	0.073	0.0128	17
6915	3	0.822	0.799	1.01	7.0×10^6	0.160	0.163	0.0155	18
6915	4	0.822	0.799	1.51	7.0×10^6	0.244	0.249	0.0198	19
6915	5	0.822	0.799	2.01	7.0×10^6	0.316	0.322	0.0257	20
6925	1	0.822	0.799	0.00	14.8×10^6	-0.005	-0.006	0.0130	21
6925	2	0.822	0.799	1.01	14.9×10^6	0.148	0.151	0.0159	22
6925	3	0.822	0.799	2.01	15.0×10^6	0.305	0.310	0.0260	23
6932	1	0.651	0.631	0.01	20.7×10^6	-0.006	-0.006	0.0068	24
6920	2	0.699	0.678	1.01	21.0×10^6	0.113	0.116	0.0070	25
6920	3	0.700	0.679	2.01	21.1×10^6	0.238	0.242	0.0070	26
6919	1	0.750	0.728	0.00	20.8×10^6	-0.008	-0.008	0.0071	27
6919	2	0.750	0.728	1.00	21.0×10^6	0.121	0.123	0.0071	28
6919	3	0.750	0.728	2.01	21.1×10^6	0.263	0.268	0.0090	29
6941	1	0.775	0.753	0.00	20.3×10^6	-0.006	-0.006	0.0071	30
6941	2	0.775	0.753	0.52	20.4×10^6	0.057	0.058	0.0074	31
6941	3	0.775	0.753	1.01	20.5×10^6	0.125	0.127	0.0078	32
6908	1	0.801	0.778	-1.10	20.5×10^6	-0.163	-0.167	0.0127	33
6910	1	0.801	0.778	0.00	20.2×10^6	-0.007	-0.007	0.0089	34
6908	3	0.801	0.778	0.41	20.8×10^6	0.051	0.052	0.0093	35
6909	1	0.801	0.778	0.91	20.6×10^6	0.132	0.134	0.0109	36
6909	2	0.801	0.778	1.41	20.6×10^6	0.204	0.208	0.0139	37
6910	2	0.801	0.778	1.91	20.3×10^6	0.285	0.290	0.0187	38
6918	2	0.823	0.800	0.00	20.8×10^6	-0.004	-0.004	0.0126	39
6936	2	0.822	0.799	0.51	20.5×10^6	0.065	0.067	0.0130	40
6918	3	0.822	0.799	1.01	20.9×10^6	0.152	0.155	0.0156	41
6940	1	0.822	0.799	0.01	29.1×10^6	0.000	0.000	0.0133	42
6939	1	0.699	0.678	0.01	38.8×10^6	-0.008	-0.008	0.0066	43
6938	1	0.799	0.776	0.01	39.5×10^6	0.002	0.002	0.0083	44
6930	1	0.800	0.777	1.42	39.5×10^6	0.212	0.216	0.0149	45
6913	1	0.822	0.799	0.00	38.3×10^6	-0.013	-0.013	0.0136	46

Table 6. Test condition [$c = 150$ mm ($AR = 2.0$)].

Run	Scan	M_s	M_c	α_s	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$	Figure
6946	1	0.793	0.777	0.01	7.1×10^6	0.005	0.005	0.0102	47
6946	2	0.792	0.776	0.51	7.1×10^6	0.087	0.088	0.0110	48
6946	3	0.792	0.776	1.01	7.1×10^6	0.168	0.171	0.0144	49
6946	4	0.792	0.776	1.51	7.1×10^6	0.249	0.252	0.0185	50
6946	5	0.792	0.776	2.01	7.1×10^6	0.320	0.324	0.0248	51
6946	6	0.792	0.776	2.51	7.2×10^6	0.381	0.386	0.0327	52
6952	1	0.799	0.782	0.01	7.0×10^6	0.009	0.010	0.0109	53
6945	1	0.817	0.800	0.01	7.1×10^6	0.001	0.001	0.0159	54
6950	1	0.649	0.638	0.01	20.8×10^6	0.002	0.003	0.0068	55
6949	1	0.792	0.776	0.01	20.9×10^6	0.007	0.007	0.0094	56
6947	1	0.801	0.784	0.00	21.0×10^6	0.002	0.002	0.0109	57
6948	1	0.818	0.801	0.00	20.9×10^6	0.009	0.009	0.0160	58

Table 7. Lift and drag force characteristics.

M_s	M_c	Re	AR	Figure
0.800	0.777	7×10^6	1.2	59
0.822	0.799	7×10^6	1.2	60
0.822	0.799	15×10^6	1.2	61
0.700	0.679	21×10^6	1.2	62
0.750	0.728	21×10^6	1.2	63
0.775	0.753	21×10^6	1.2	64
0.801	0.778	21×10^6	1.2	65
0.823	0.800	21×10^6	1.2	66
0.800	0.777	40×10^6	1.2	67
0.792	0.776	7×10^6	2.0	68

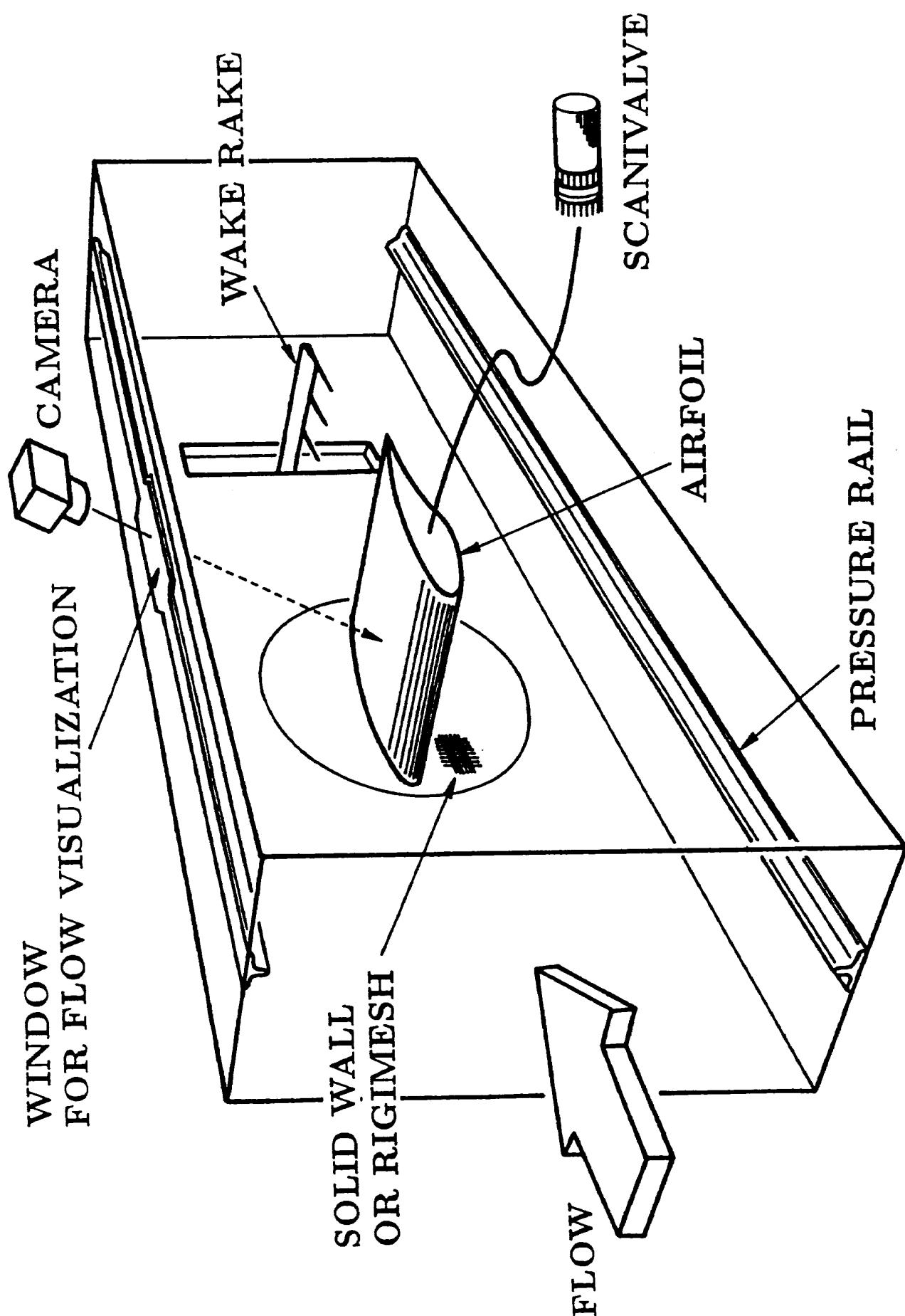


Fig. 1 Test section schematic.

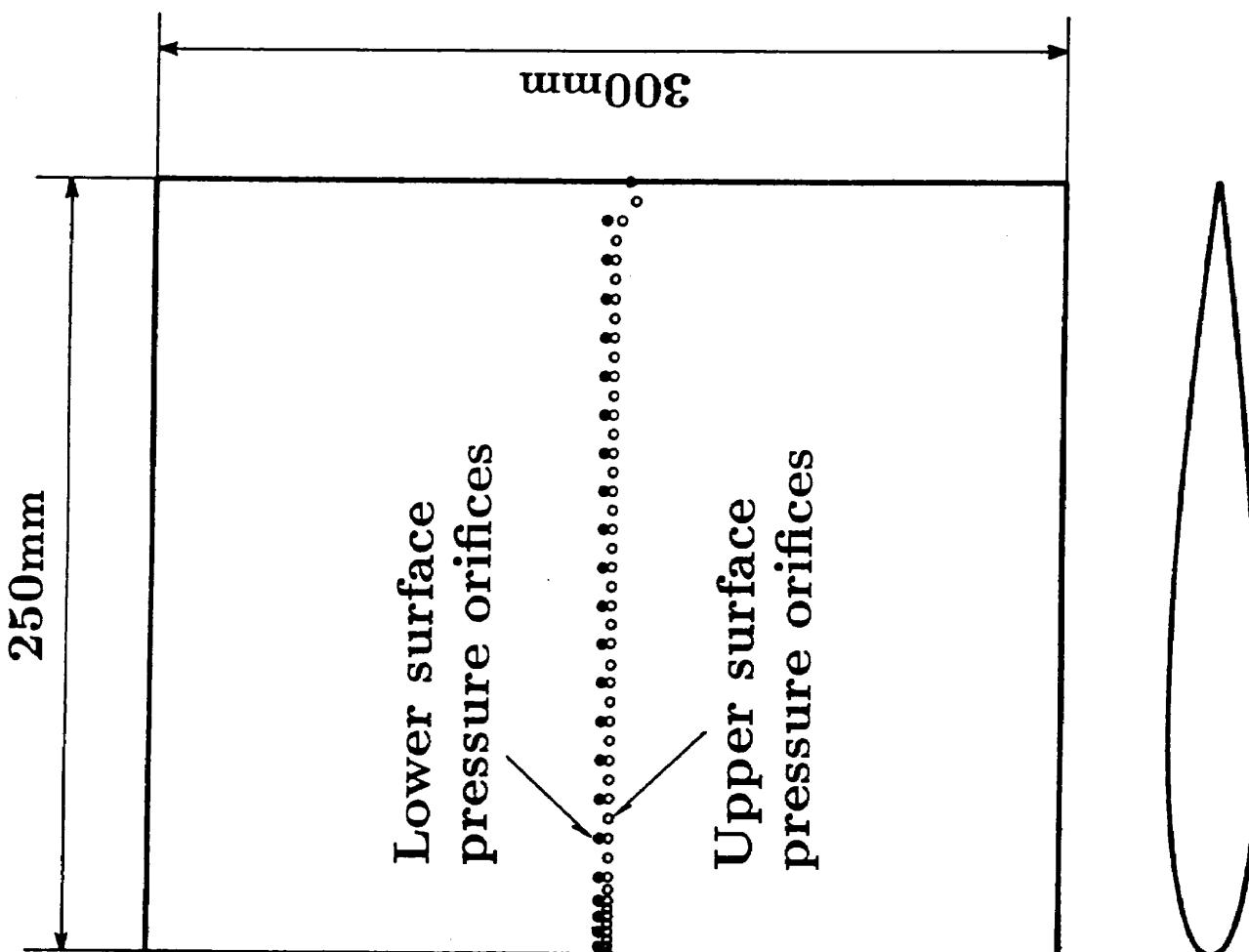


Fig. 2 (a) Pressure orifice location of NACA0012 airfoil model ($c = 250$ mm).

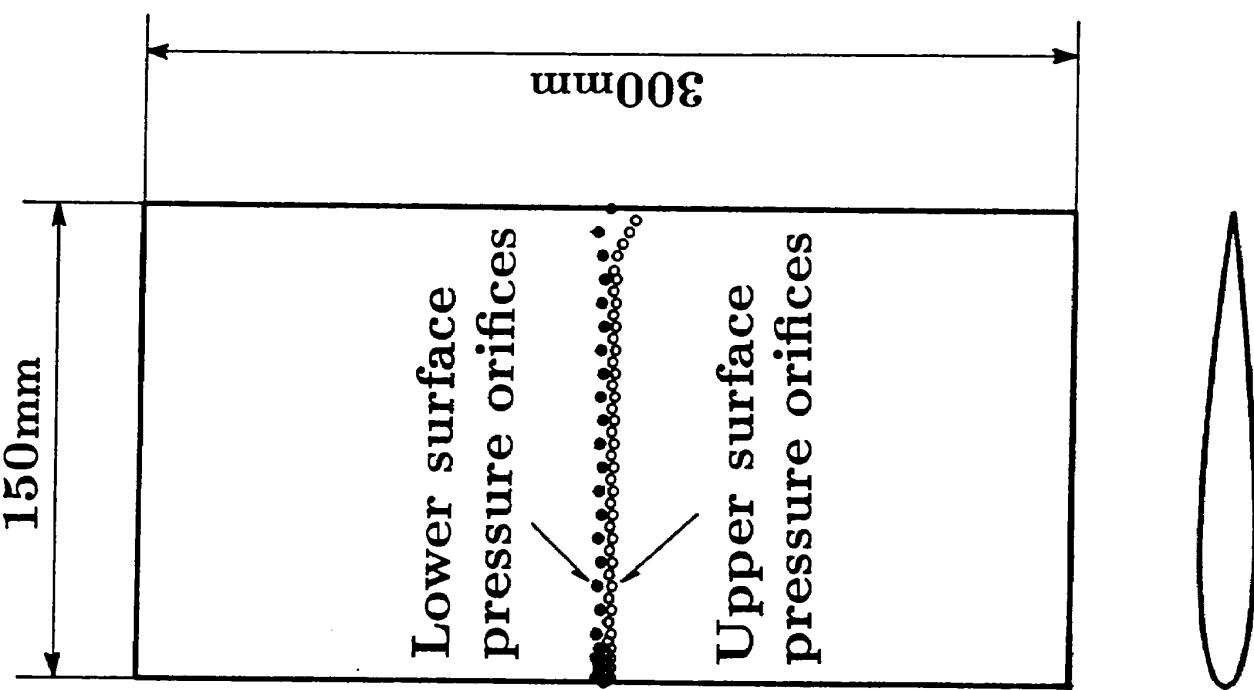


Fig. 2 (b) Pressure orifice location of NACA0012 airfoil model ($c = 150$ mm).

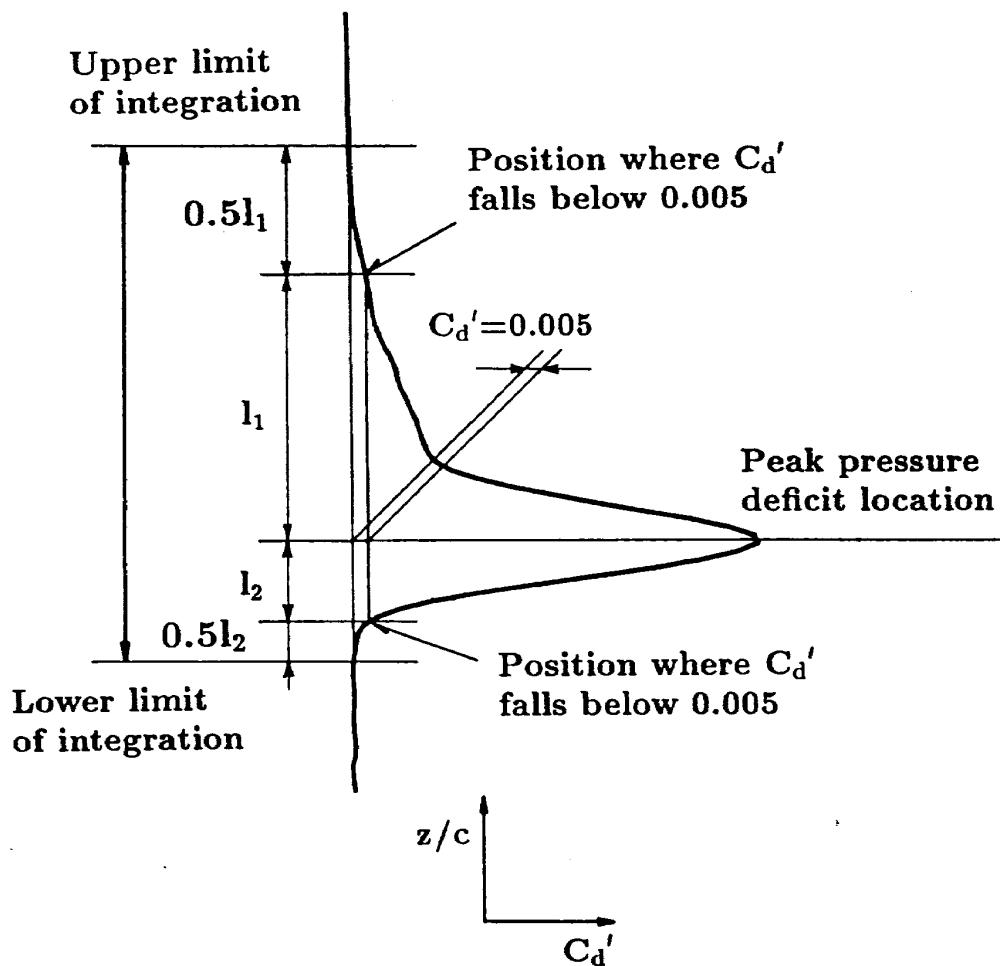
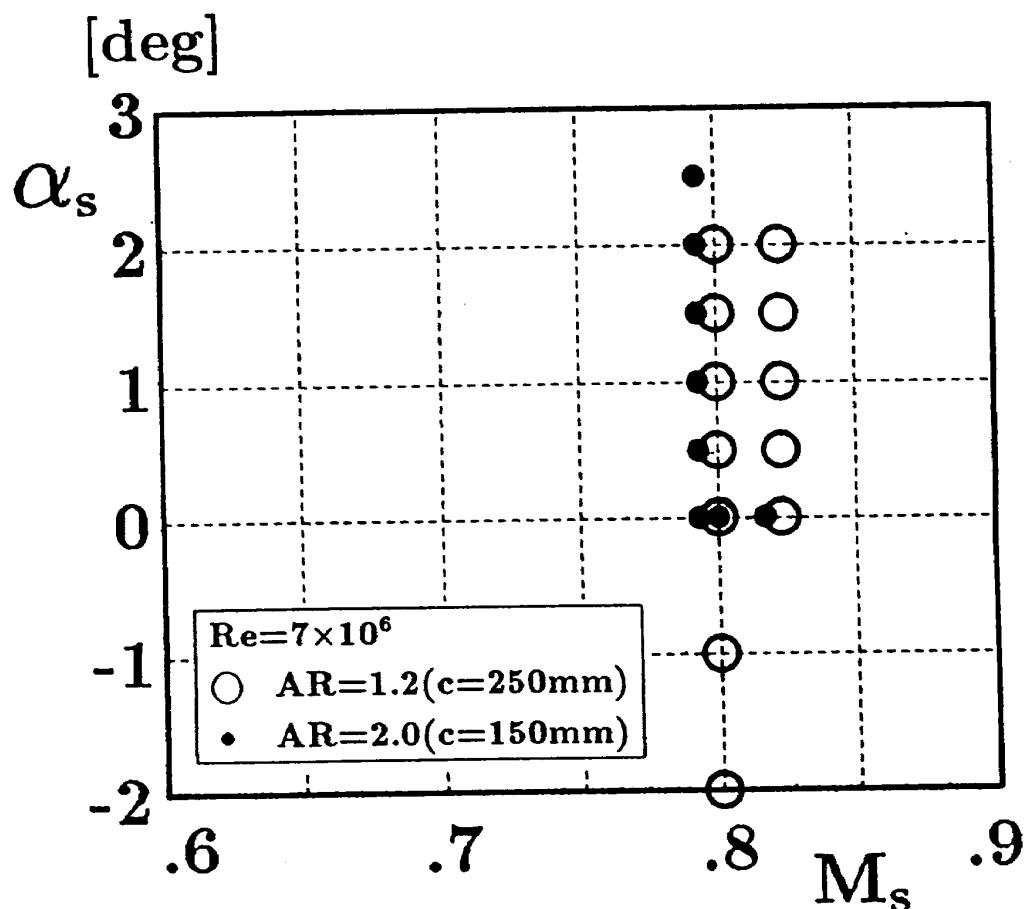
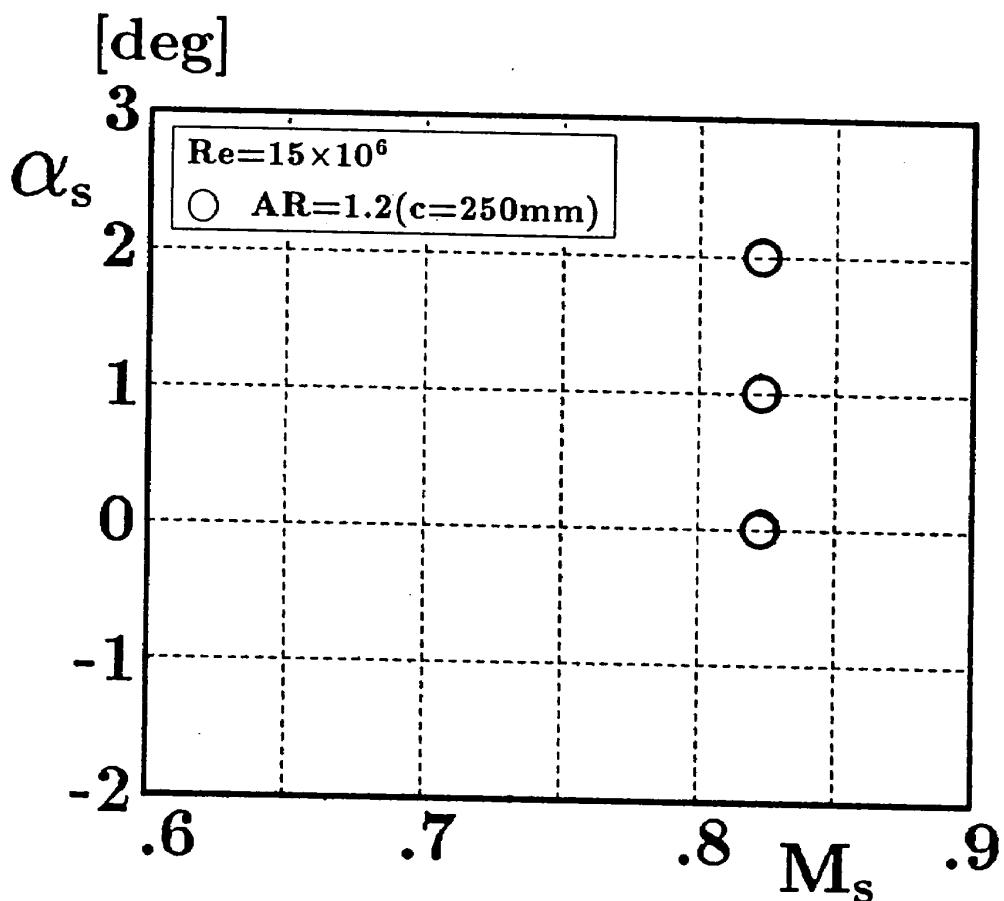
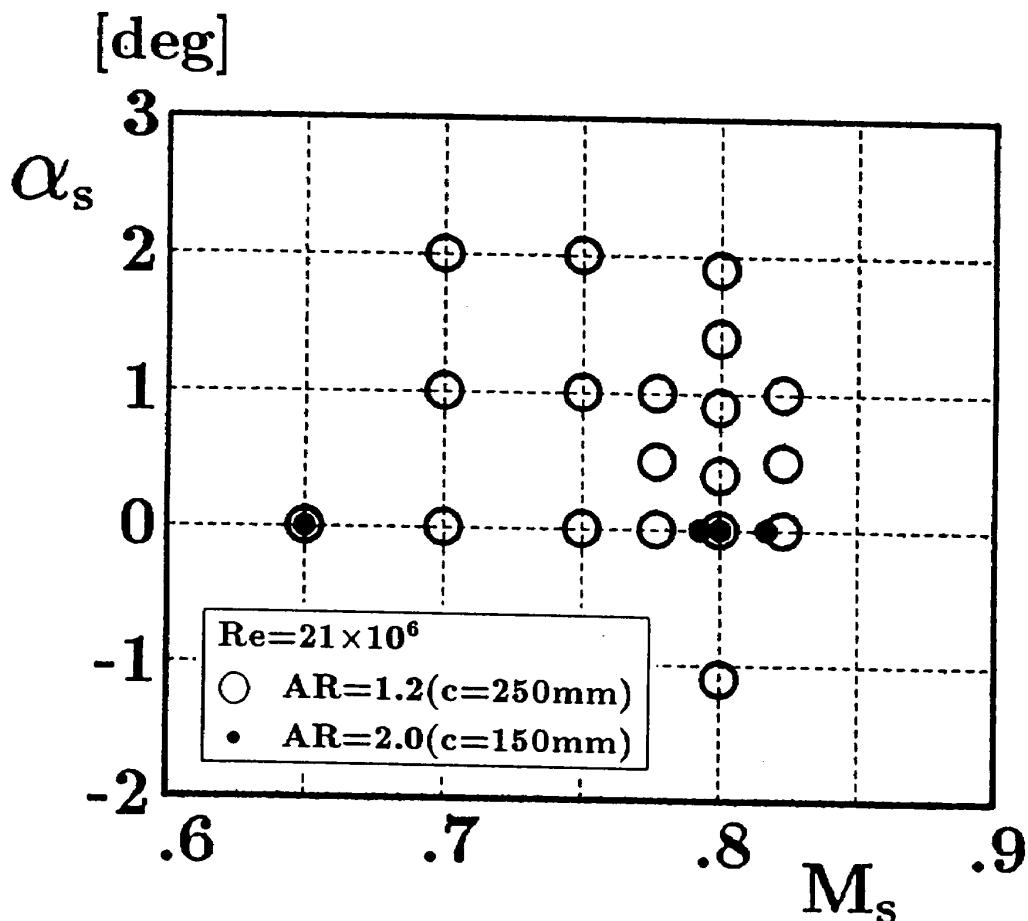
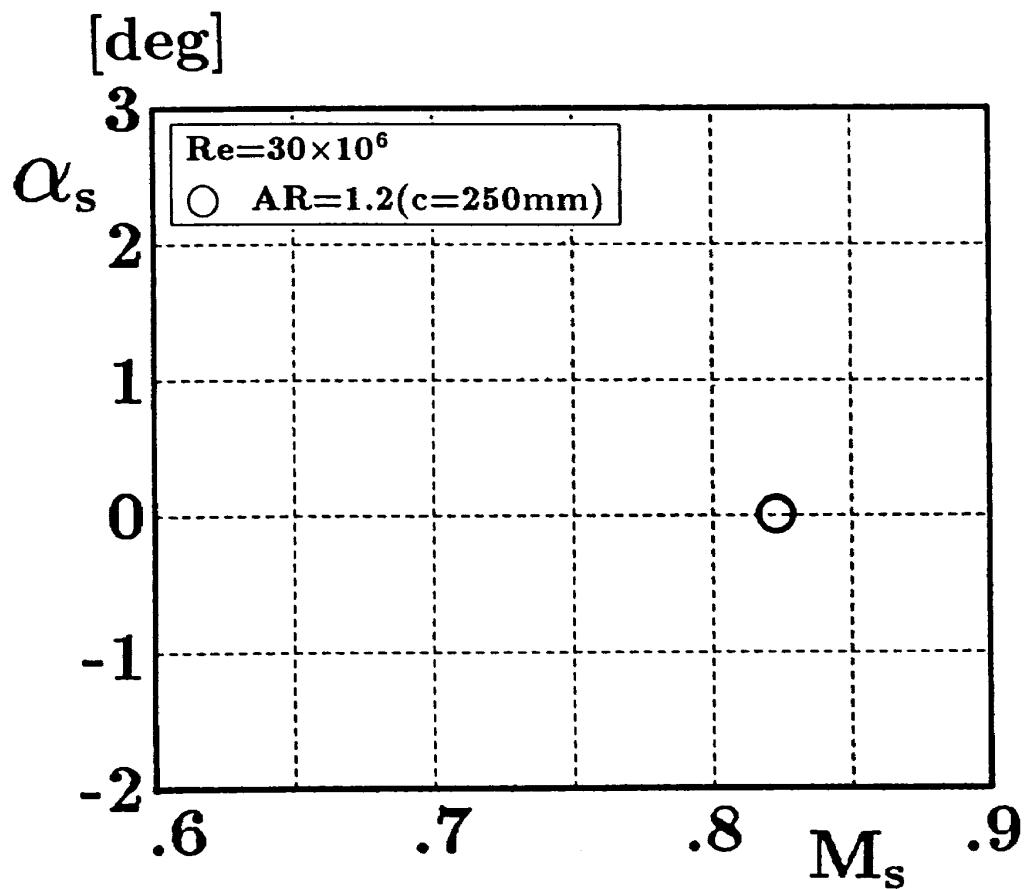
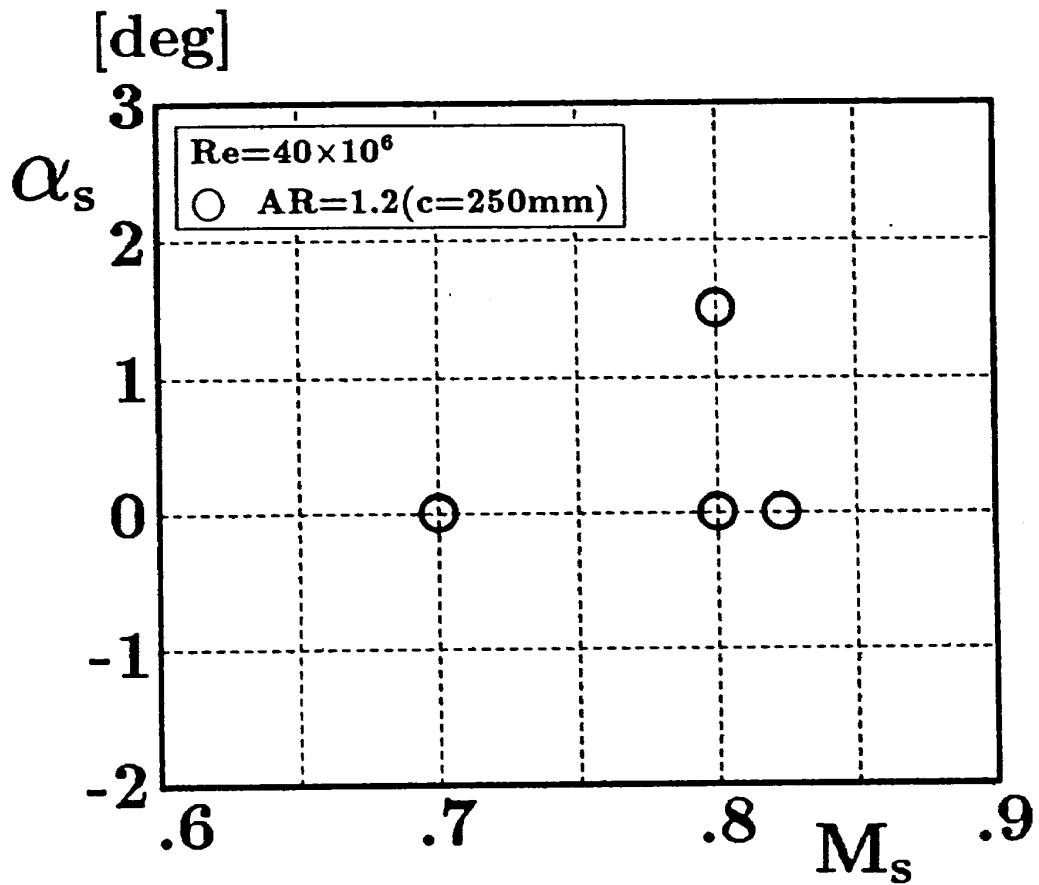


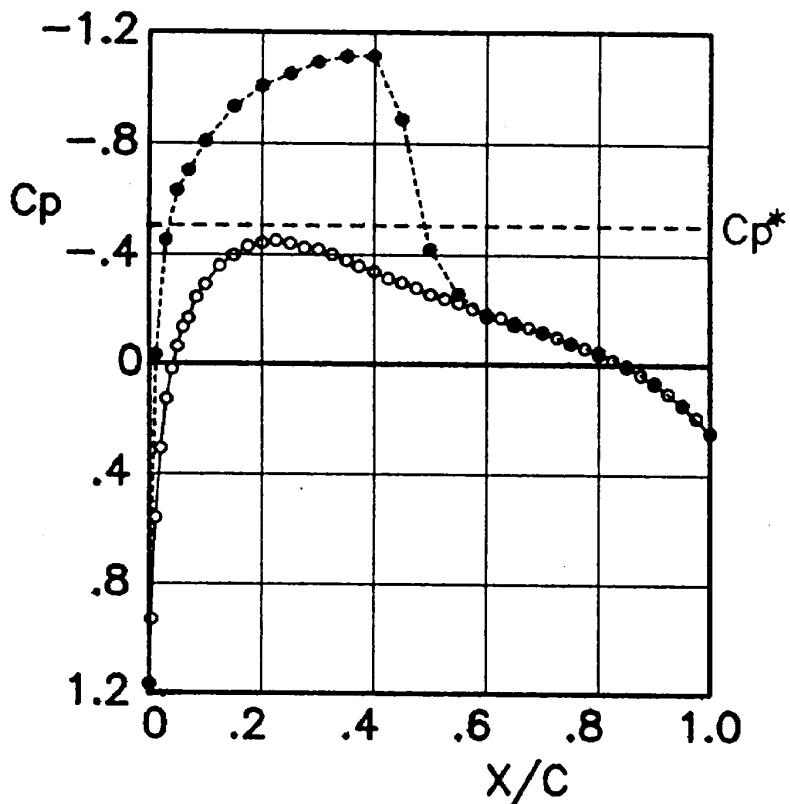
Fig. 3 Integration limit definition of the wake.

Fig. 4 Test condition ($Re = 7 \times 10^6$).

Fig. 5 Test condition ($Re = 15 \times 10^6$).Fig. 6 Test condition ($Re = 21 \times 10^6$).

Fig. 7 Test condition ($Re = 30 \times 10^6$).Fig. 8 Test condition ($Re = 40 \times 10^6$).

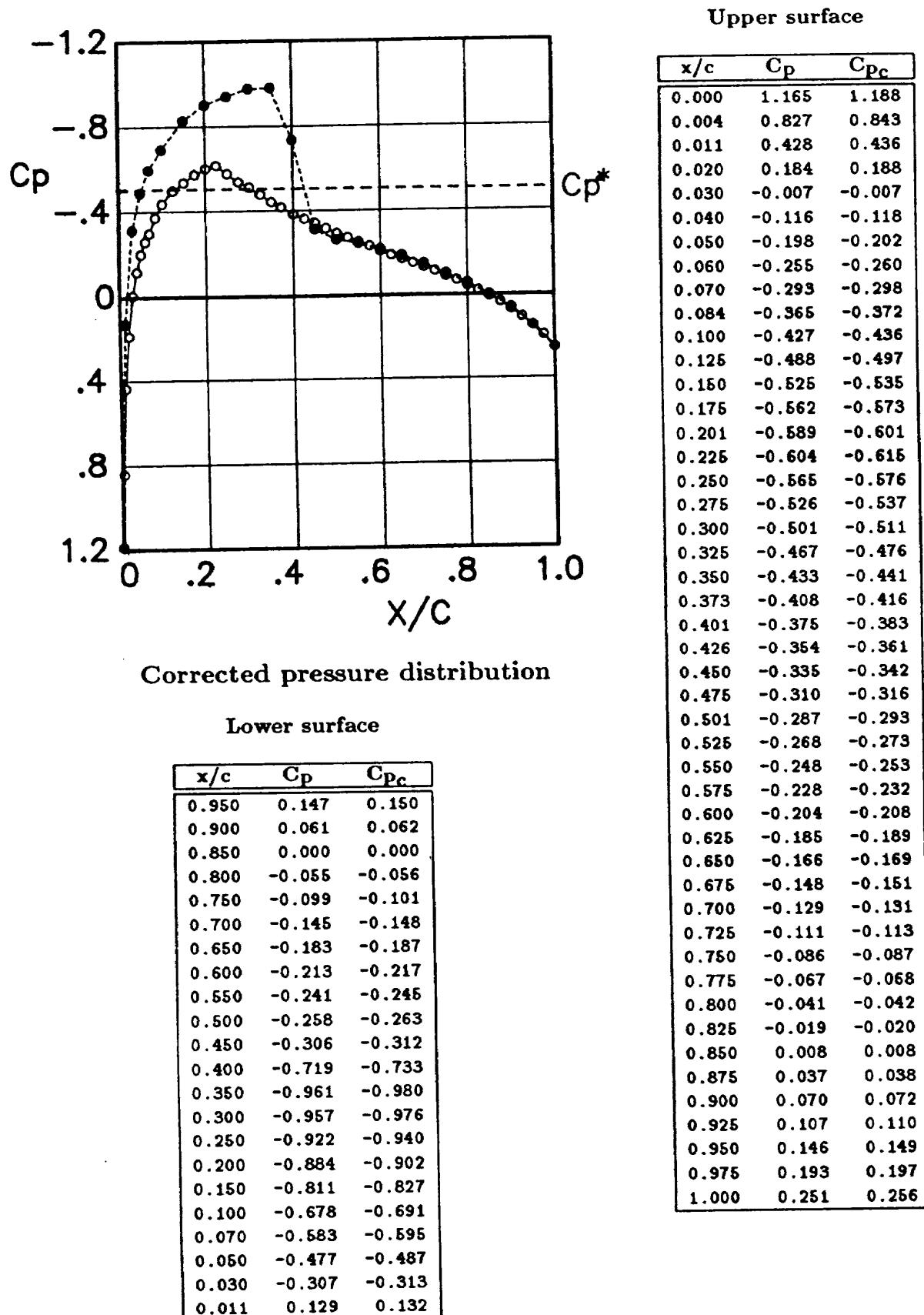
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6917	1	0.800	0.777	-2.01	7.0×10^6	-0.291	-0.297	0.0185



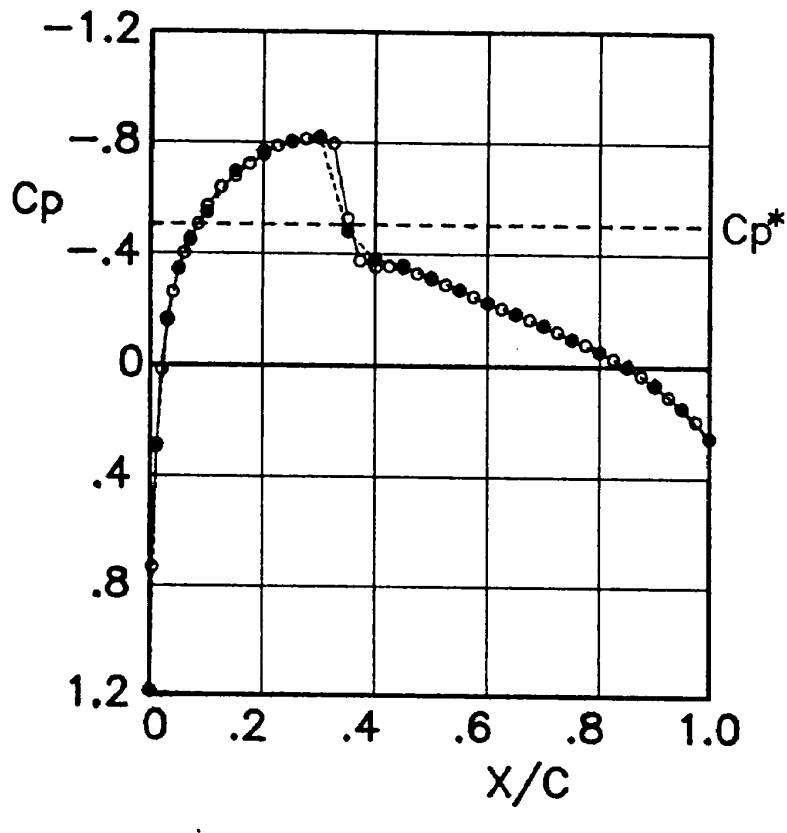
x/c	C _p	C _{p_c}
0.000	1.144	1.167
0.004	0.912	0.929
0.011	0.548	0.559
0.020	0.302	0.307
0.030	0.125	0.128
0.040	0.019	0.019
0.050	-0.064	-0.065
0.060	-0.132	-0.136
0.070	-0.166	-0.169
0.084	-0.241	-0.245
0.100	-0.287	-0.293
0.125	-0.353	-0.360
0.150	-0.390	-0.398
0.175	-0.422	-0.431
0.201	-0.435	-0.443
0.225	-0.443	-0.451
0.250	-0.432	-0.441
0.275	-0.416	-0.424
0.300	-0.411	-0.419
0.325	-0.393	-0.401
0.350	-0.373	-0.380
0.373	-0.351	-0.358
0.401	-0.333	-0.339
0.426	-0.308	-0.314
0.450	-0.294	-0.299
0.475	-0.275	-0.281
0.501	-0.252	-0.257
0.525	-0.236	-0.241
0.550	-0.221	-0.226
0.575	-0.201	-0.205
0.600	-0.181	-0.184
0.625	-0.169	-0.173
0.650	-0.151	-0.154
0.675	-0.133	-0.136
0.700	-0.115	-0.117
0.725	-0.099	-0.101
0.750	-0.077	-0.079
0.775	-0.060	-0.061
0.800	-0.035	-0.036
0.825	-0.015	-0.015
0.850	0.011	0.011
0.875	0.038	0.039
0.900	0.070	0.071
0.925	0.104	0.106
0.950	0.144	0.147
0.975	0.190	0.194
1.000	0.244	0.248

Fig. 9 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6917	2	0.800	0.777	-1.00	7.0×10^6	-0.145	-0.148	0.0106

Fig. 10 Pressure distribution ($c = 250$ mm).

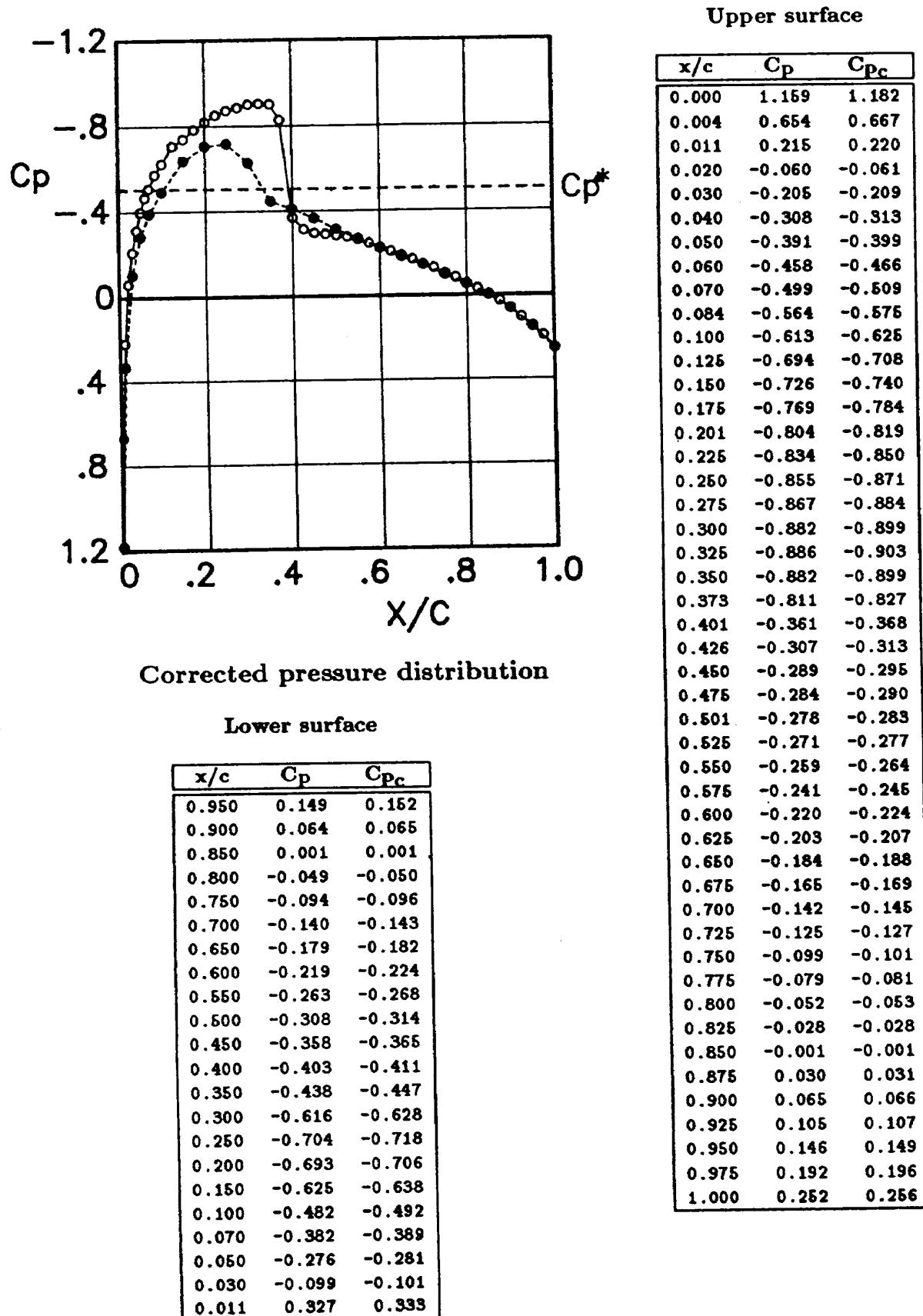
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6916	7	0.800	0.777	0.01	7.1×10^6	0.002	0.002	0.0084



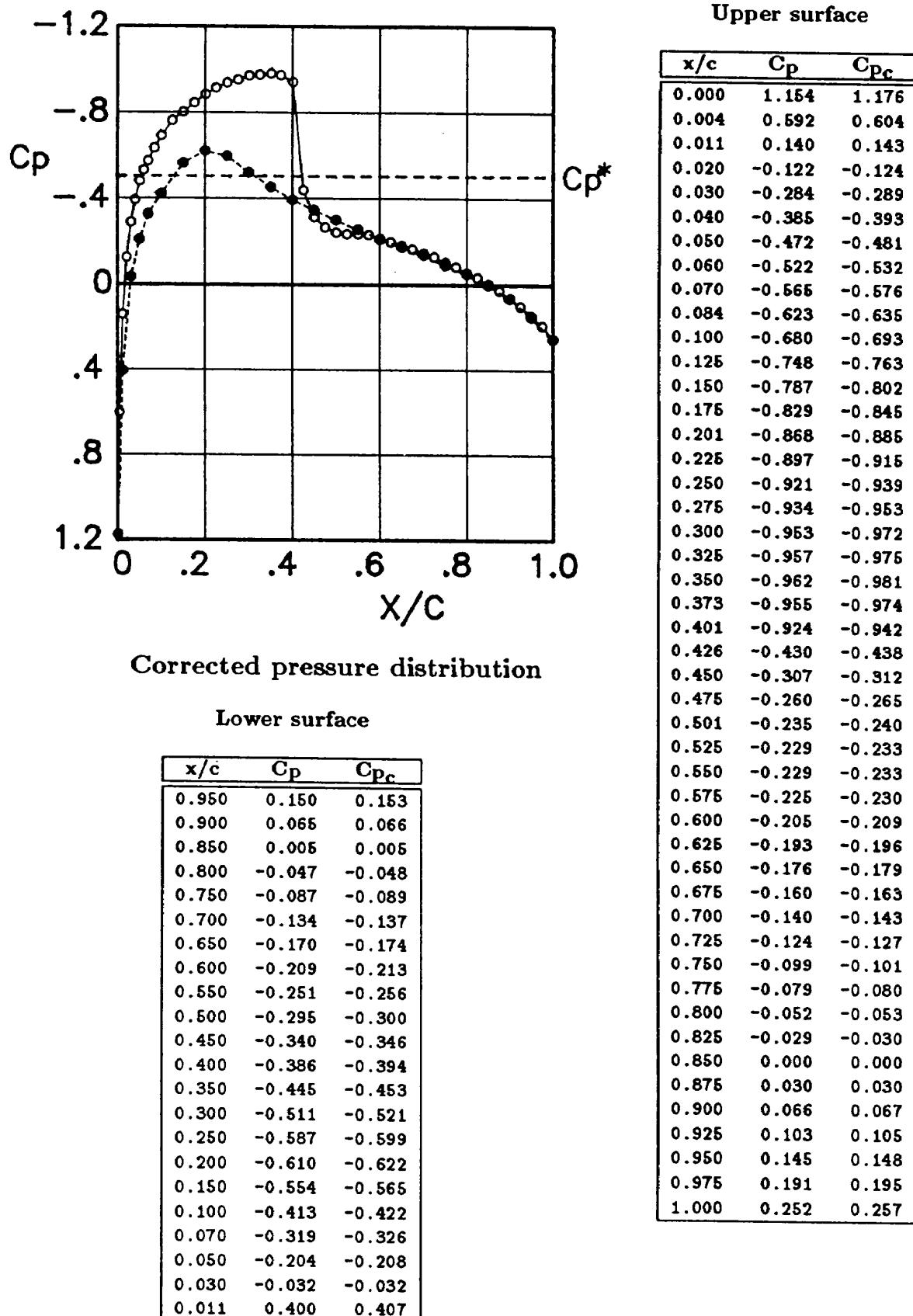
x/c	Cp	Cpc
0.000	1.163	1.186
0.004	0.715	0.728
0.011	0.288	0.293
0.020	0.016	0.017
0.030	-0.157	-0.160
0.040	-0.259	-0.264
0.050	-0.341	-0.348
0.060	-0.395	-0.403
0.070	-0.439	-0.447
0.084	-0.496	-0.506
0.100	-0.560	-0.570
0.125	-0.627	-0.639
0.150	-0.666	-0.679
0.175	-0.709	-0.723
0.201	-0.743	-0.757
0.225	-0.773	-0.788
0.250	-0.790	-0.805
0.275	-0.798	-0.813
0.300	-0.802	-0.817
0.325	-0.782	-0.797
0.350	-0.518	-0.528
0.373	-0.369	-0.376
0.401	-0.347	-0.353
0.426	-0.350	-0.357
0.450	-0.343	-0.350
0.475	-0.325	-0.331
0.501	-0.305	-0.311
0.525	-0.286	-0.292
0.550	-0.268	-0.273
0.575	-0.245	-0.249
0.600	-0.222	-0.226
0.625	-0.203	-0.206
0.650	-0.182	-0.186
0.675	-0.164	-0.167
0.700	-0.142	-0.144
0.725	-0.121	-0.123
0.750	-0.096	-0.098
0.775	-0.076	-0.078
0.800	-0.050	-0.051
0.825	-0.026	-0.027
0.850	0.003	0.003
0.875	0.033	0.034
0.900	0.069	0.070
0.925	0.108	0.110
0.950	0.146	0.149
0.975	0.193	0.196
1.000	0.252	0.257

Fig. 11 Pressure distribution ($c = 250$ mm).

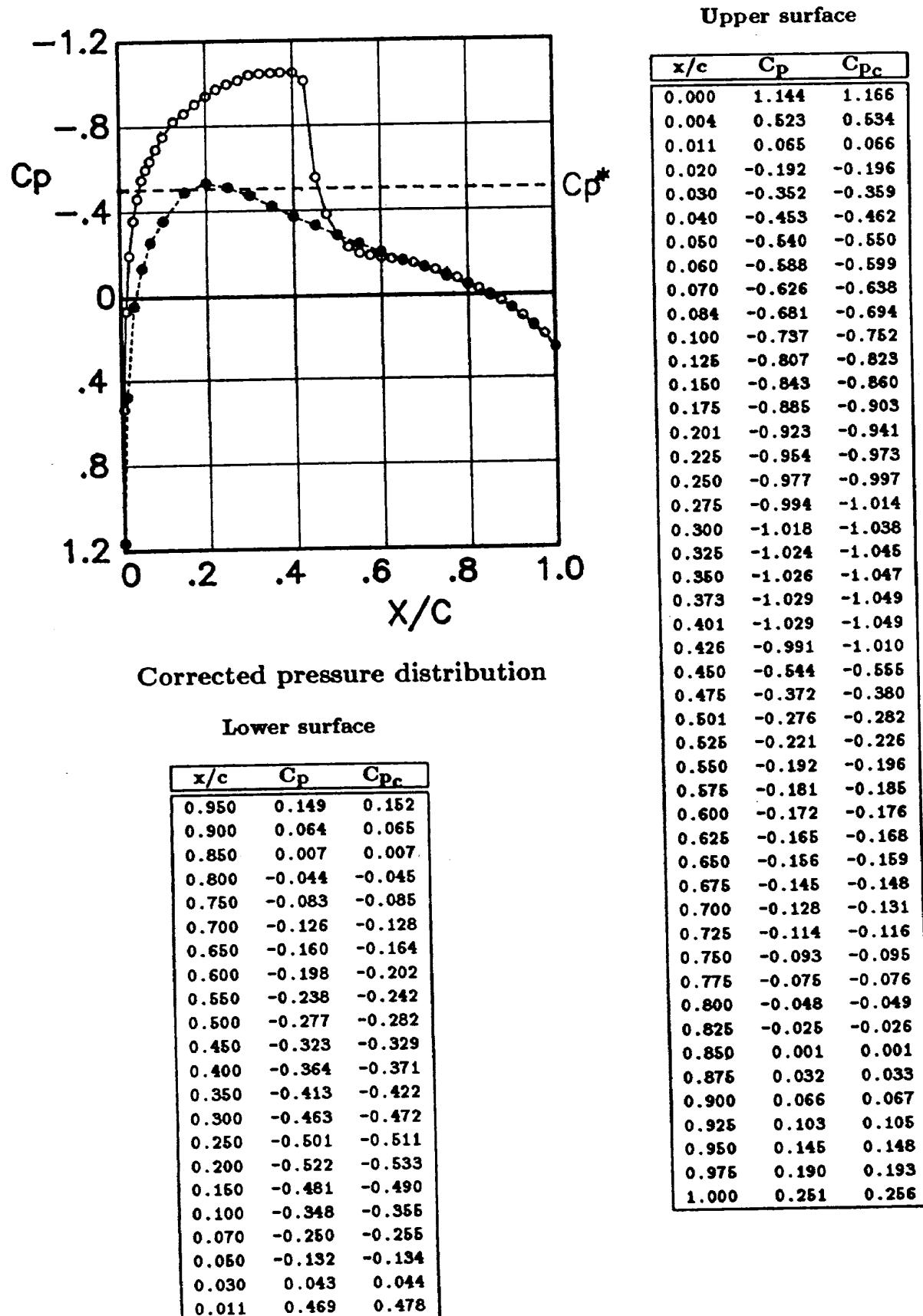
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6916	2	0.800	0.777	0.51	7.1×10^6	0.069	0.070	0.0089

Fig. 12 Pressure distribution ($c = 250$ mm).

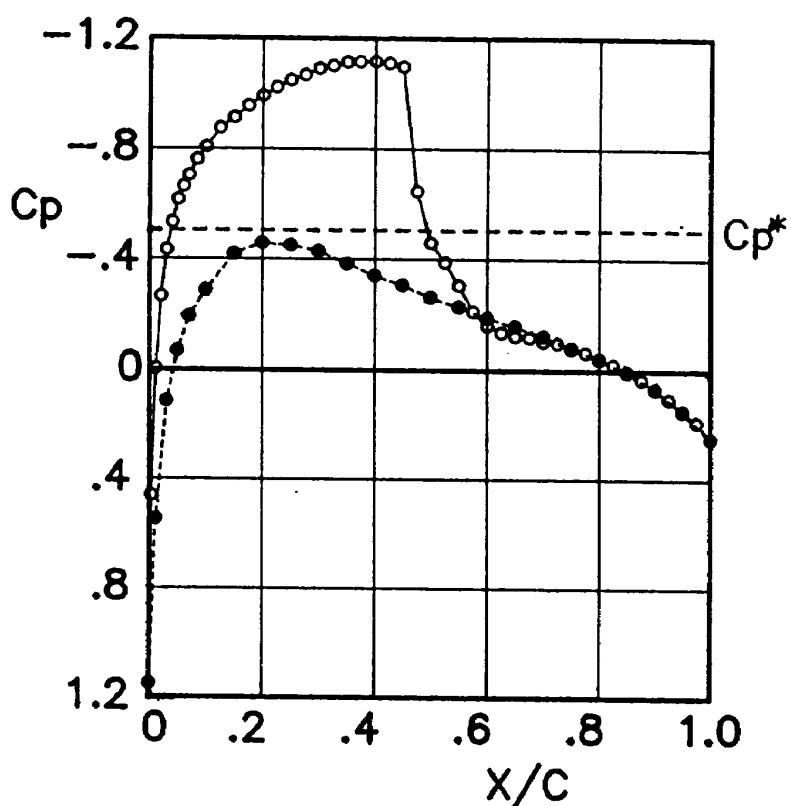
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6916	3	0.799	0.776	1.01	7.1×10^6	0.142	0.144	0.0109

Fig. 13 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6916	4	0.799	0.776	1.51	7.1×10^6	0.216	0.220	0.0137

Fig. 14 Pressure distribution ($c = 250$ mm).

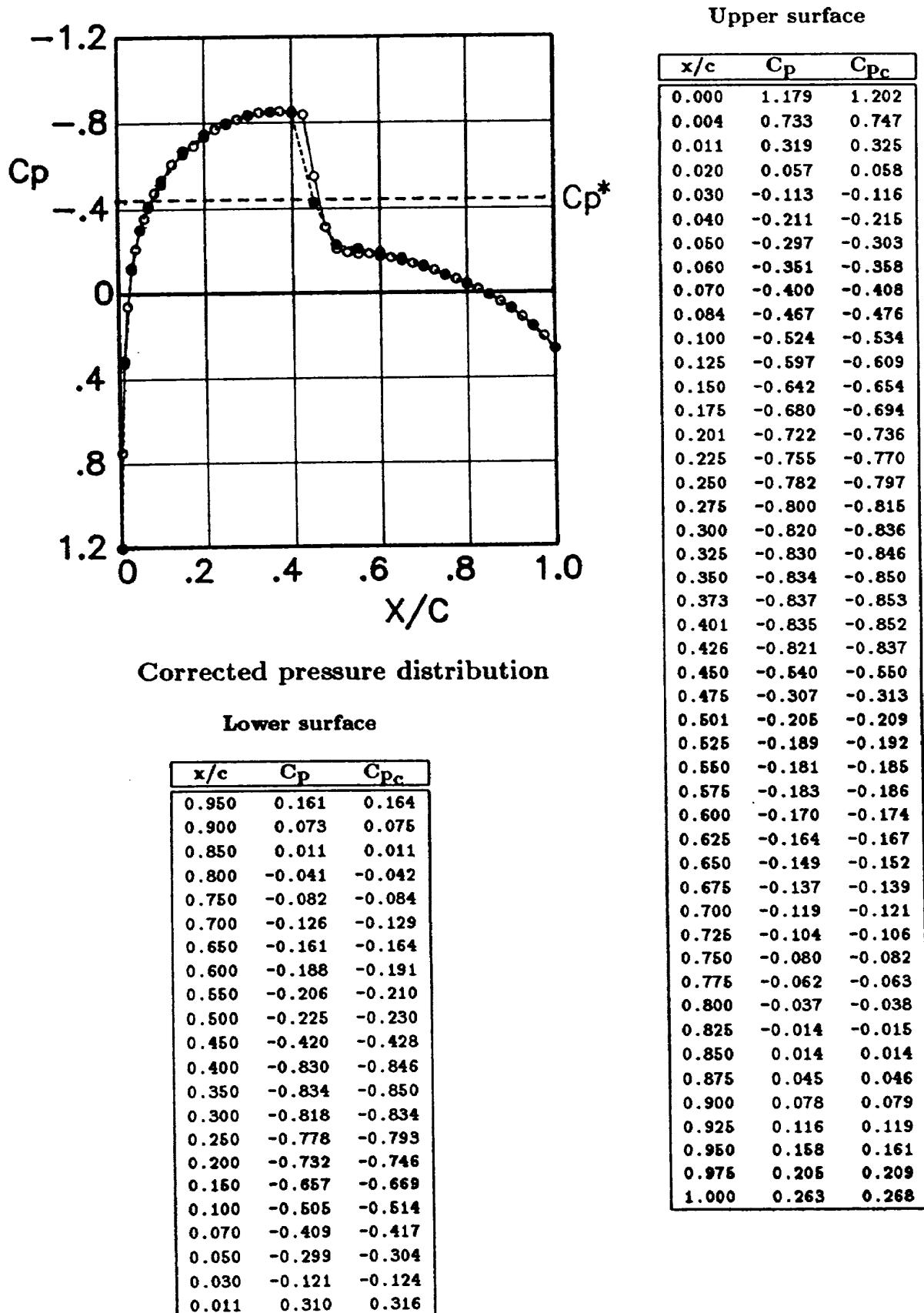
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6916	5	0.800	0.777	2.01	7.1×10^6	0.295	0.301	0.0185



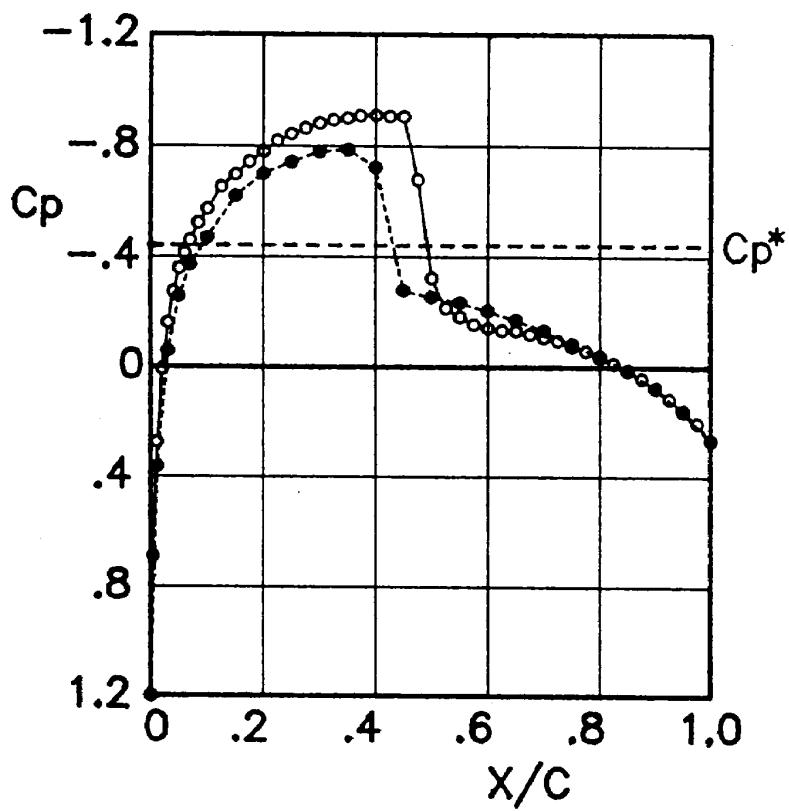
x/c	Cp	C _{Pc}
0.000	1.127	1.149
0.004	0.451	0.460
0.011	-0.005	-0.005
0.020	-0.262	-0.267
0.030	-0.426	-0.433
0.040	-0.524	-0.534
0.050	-0.605	-0.616
0.060	-0.652	-0.664
0.070	-0.692	-0.706
0.084	-0.748	-0.762
0.100	-0.792	-0.807
0.125	-0.859	-0.876
0.150	-0.897	-0.914
0.175	-0.938	-0.956
0.201	-0.973	-0.992
0.225	-1.004	-1.023
0.250	-1.029	-1.049
0.275	-1.047	-1.067
0.300	-1.070	-1.091
0.325	-1.080	-1.101
0.350	-1.093	-1.114
0.375	-1.094	-1.116
0.401	-1.095	-1.117
0.426	-1.089	-1.110
0.450	-1.076	-1.097
0.475	-0.634	-0.646
0.501	-0.450	-0.459
0.525	-0.380	-0.388
0.550	-0.299	-0.305
0.575	-0.207	-0.211
0.600	-0.156	-0.159
0.625	-0.132	-0.135
0.650	-0.120	-0.122
0.675	-0.115	-0.117
0.700	-0.100	-0.102
0.725	-0.094	-0.096
0.750	-0.074	-0.076
0.775	-0.062	-0.063
0.800	-0.037	-0.038
0.825	-0.019	-0.019
0.850	0.006	0.006
0.875	0.035	0.035
0.900	0.069	0.071
0.925	0.104	0.106
0.950	0.146	0.149
0.975	0.187	0.190
1.000	0.246	0.250

Fig. 15 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6915	7	0.822	0.799	0.01	7.0×10^6	0.006	0.006	0.0122

Fig. 16 Pressure distribution ($c = 250$ mm).

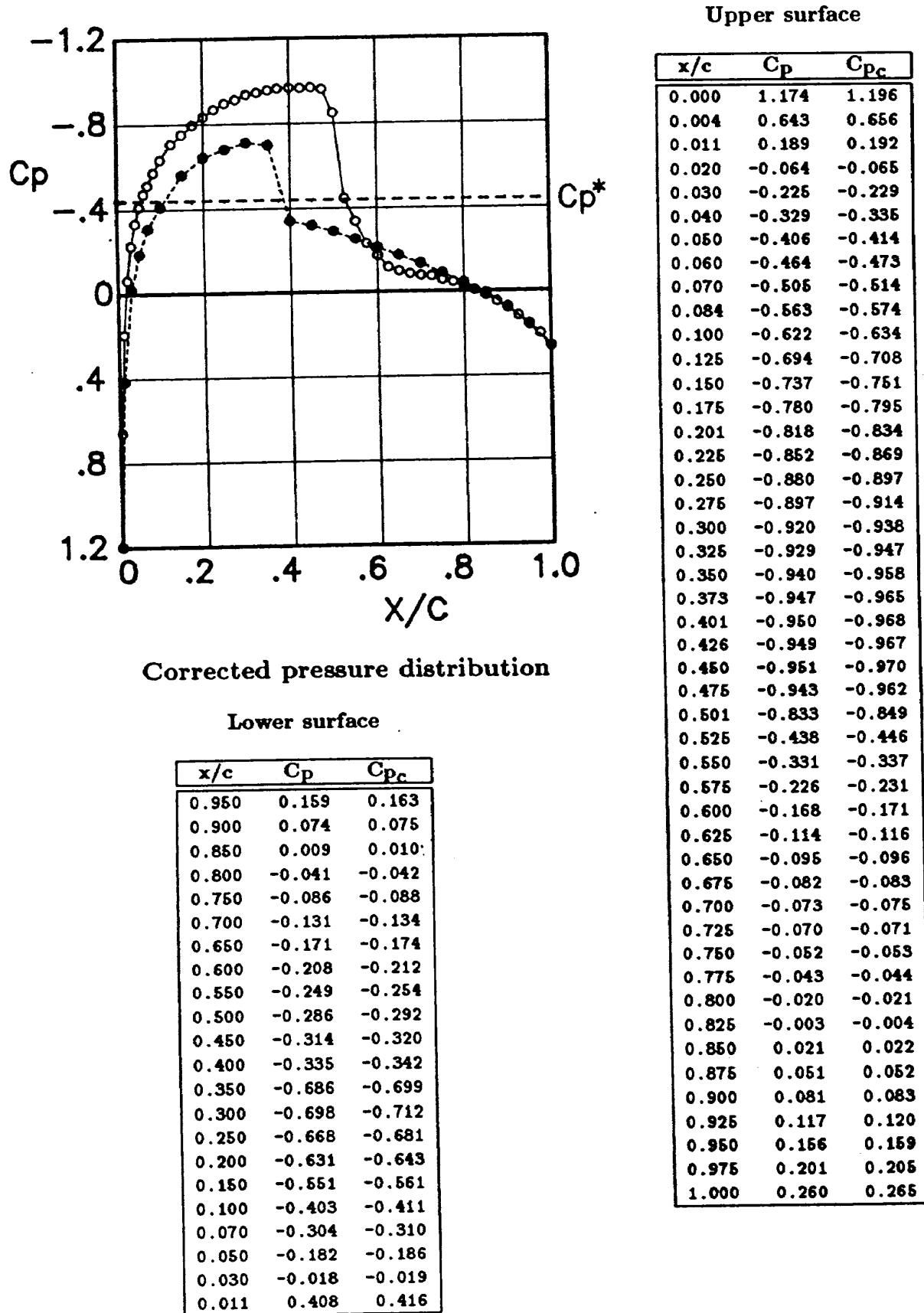
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6915	2	0.822	0.799	0.51	7.0×10^6	0.072	0.073	0.0128



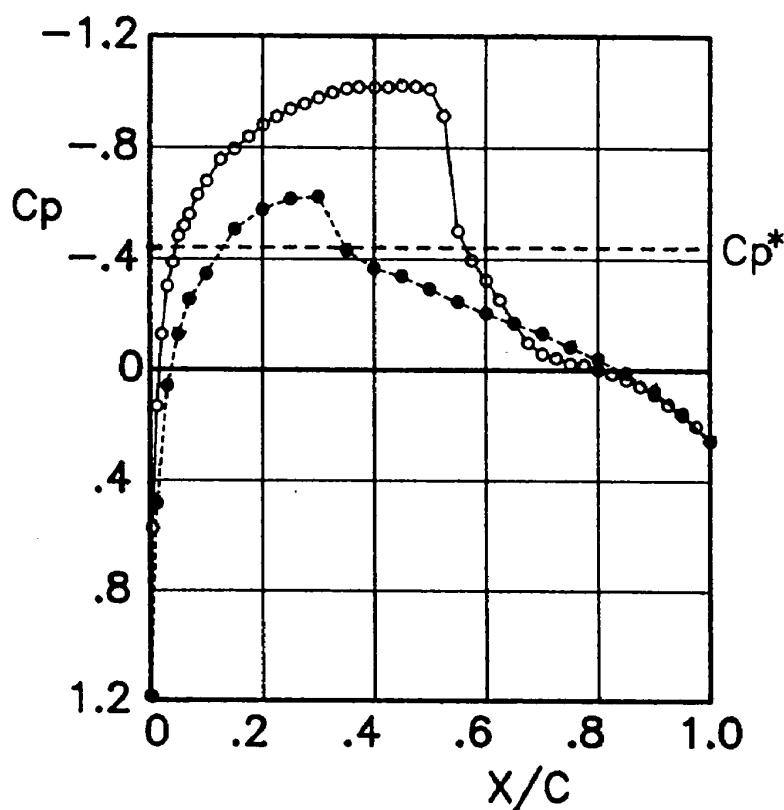
x/c	Cp	Cpc
0.000	1.176	1.199
0.004	0.675	0.688
0.011	0.267	0.272
0.020	0.008	0.008
0.030	-0.159	-0.162
0.040	-0.270	-0.275
0.050	-0.351	-0.358
0.060	-0.405	-0.413
0.070	-0.452	-0.460
0.084	-0.512	-0.522
0.100	-0.563	-0.574
0.125	-0.641	-0.654
0.150	-0.685	-0.698
0.175	-0.729	-0.743
0.201	-0.764	-0.779
0.225	-0.804	-0.820
0.250	-0.828	-0.844
0.275	-0.848	-0.864
0.300	-0.866	-0.883
0.325	-0.878	-0.895
0.350	-0.885	-0.902
0.373	-0.893	-0.910
0.401	-0.895	-0.912
0.426	-0.891	-0.908
0.450	-0.890	-0.907
0.475	-0.666	-0.679
0.501	-0.317	-0.323
0.525	-0.210	-0.214
0.550	-0.178	-0.182
0.575	-0.152	-0.154
0.600	-0.139	-0.141
0.625	-0.130	-0.133
0.650	-0.129	-0.131
0.675	-0.117	-0.119
0.700	-0.105	-0.107
0.725	-0.094	-0.096
0.750	-0.073	-0.074
0.775	-0.057	-0.058
0.800	-0.033	-0.033
0.825	-0.012	-0.013
0.850	0.015	0.015
0.875	0.043	0.044
0.900	0.077	0.079
0.925	0.115	0.117
0.950	0.157	0.160
0.975	0.202	0.206
1.000	0.263	0.268

Fig. 17 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6915	3	0.822	0.799	1.01	7.0×10^6	0.160	0.163	0.0155

Fig. 18 Pressure distribution ($c = 250$ mm).

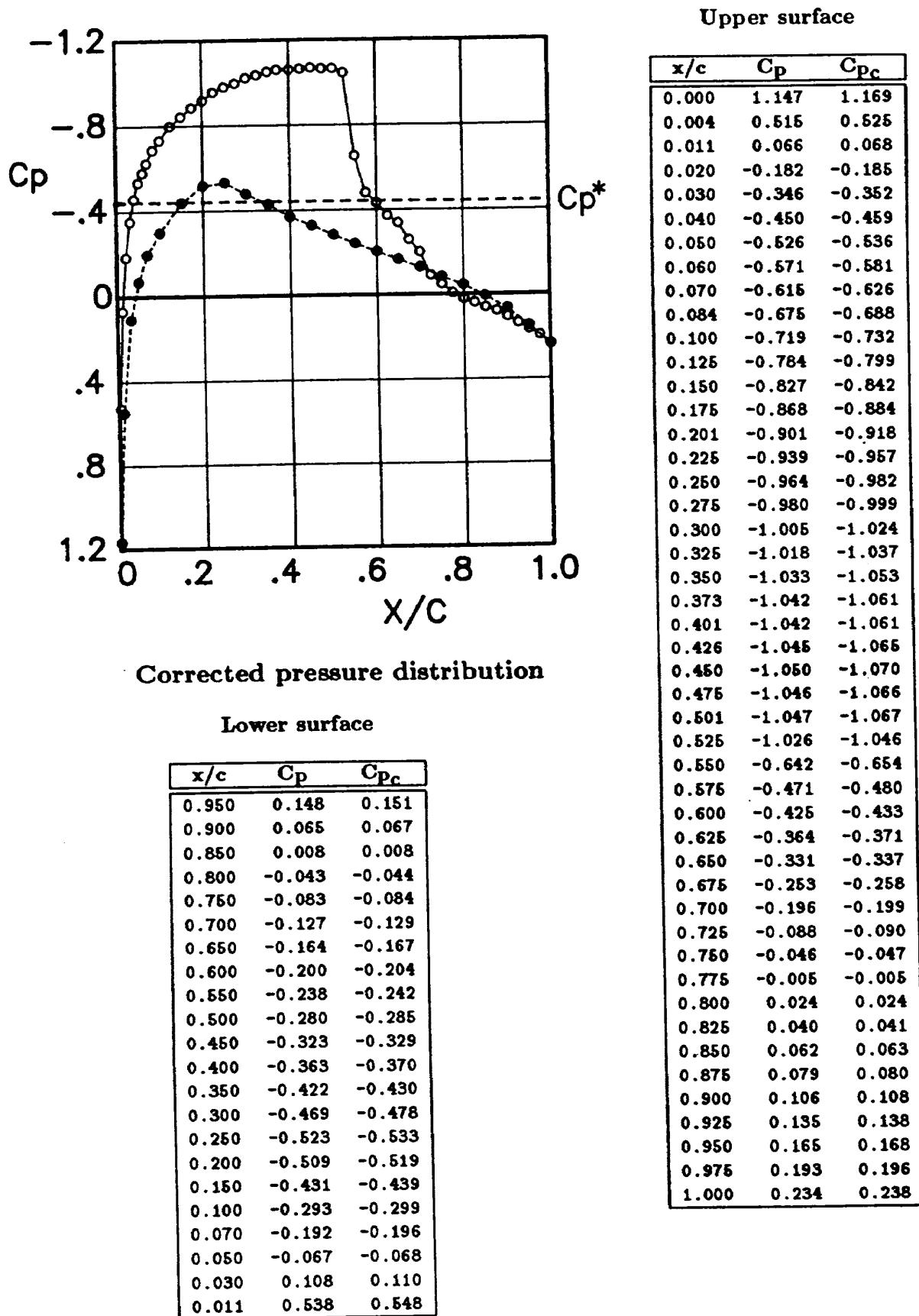
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6915	4	0.822	0.799	1.51	7.0×10^6	0.244	0.249	0.0198



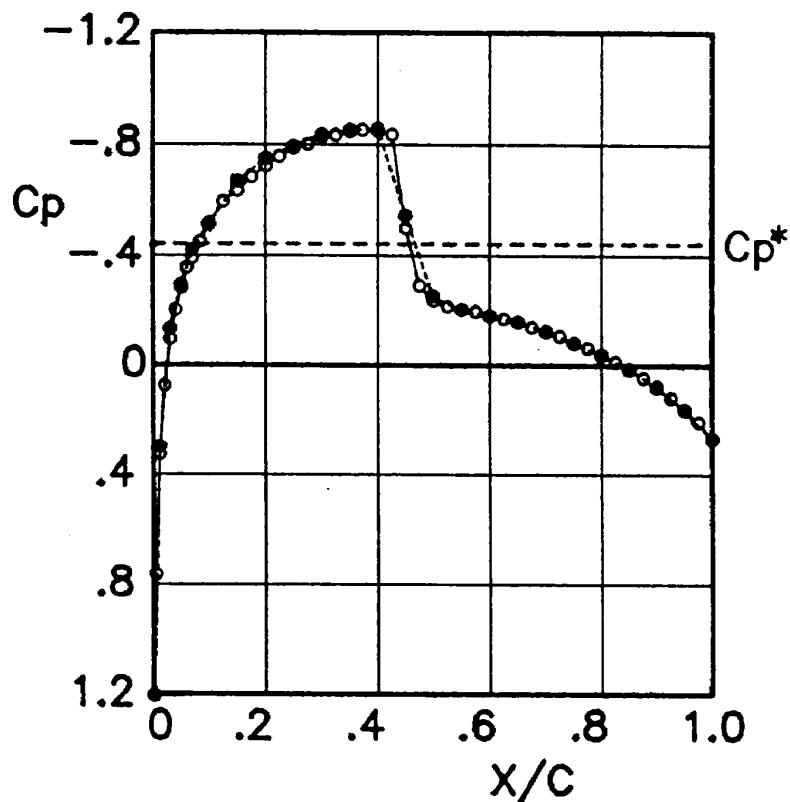
x/c	Cp	C _{Pc}
0.000	1.162	1.184
0.004	0.560	0.571
0.011	0.128	0.131
0.020	-0.127	-0.129
0.030	-0.298	-0.303
0.040	-0.381	-0.389
0.050	-0.474	-0.483
0.060	-0.510	-0.520
0.070	-0.549	-0.560
0.084	-0.620	-0.632
0.100	-0.667	-0.680
0.125	-0.743	-0.757
0.150	-0.780	-0.795
0.175	-0.823	-0.839
0.201	-0.865	-0.881
0.225	-0.894	-0.911
0.250	-0.921	-0.939
0.275	-0.939	-0.957
0.300	-0.961	-0.979
0.325	-0.980	-0.998
0.350	-0.993	-1.012
0.373	-0.999	-1.018
0.401	-0.998	-1.017
0.426	-0.998	-1.017
0.450	-1.005	-1.024
0.475	-1.000	-1.019
0.501	-0.992	-1.011
0.525	-0.897	-0.914
0.550	-0.491	-0.500
0.575	-0.388	-0.395
0.600	-0.318	-0.324
0.625	-0.248	-0.253
0.650	-0.167	-0.170
0.675	-0.096	-0.098
0.700	-0.056	-0.057
0.725	-0.042	-0.043
0.750	-0.022	-0.022
0.775	-0.018	-0.018
0.800	0.001	0.001
0.825	0.015	0.016
0.850	0.036	0.036
0.875	0.059	0.060
0.900	0.086	0.088
0.925	0.123	0.125
0.950	0.160	0.163
0.975	0.199	0.203
1.000	0.251	0.256

Fig. 19 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6915	5	0.822	0.799	2.01	7.0×10^6	0.316	0.322	0.0257

Fig. 20 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6925	1	0.822	0.799	0.00	14.8×10^6	-0.005	-0.006	0.0130



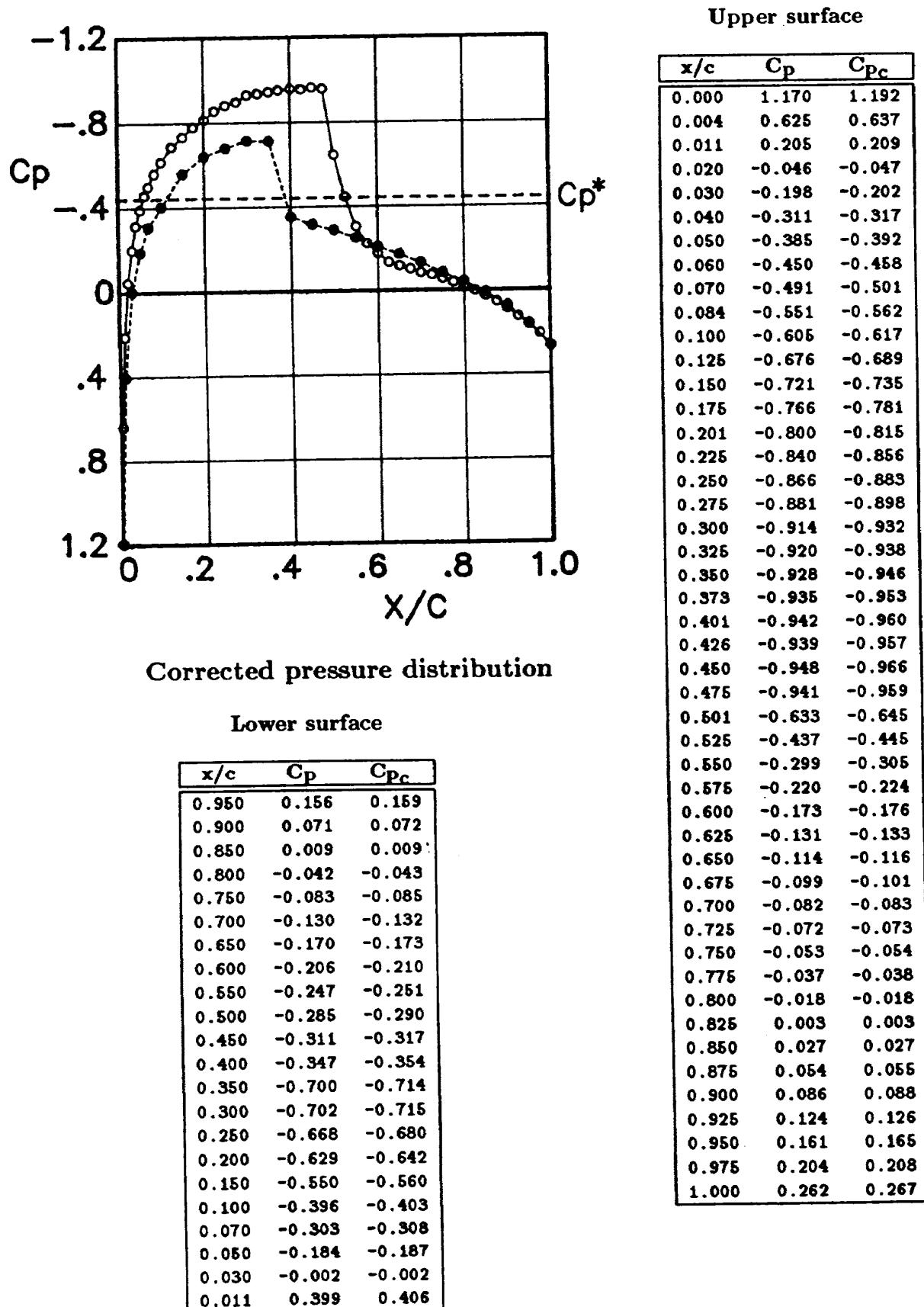
x/c	Cp	C _{Pc}
0.000	1.180	1.203
0.004	0.749	0.763
0.011	0.320	0.326
0.020	0.072	0.073
0.030	-0.094	-0.096
0.040	-0.199	-0.203
0.050	-0.278	-0.284
0.060	-0.350	-0.356
0.070	-0.384	-0.392
0.084	-0.443	-0.452
0.100	-0.510	-0.520
0.125	-0.584	-0.596
0.150	-0.623	-0.636
0.175	-0.671	-0.684
0.201	-0.709	-0.723
0.225	-0.743	-0.758
0.250	-0.772	-0.787
0.275	-0.786	-0.801
0.300	-0.813	-0.828
0.325	-0.820	-0.836
0.350	-0.832	-0.848
0.373	-0.838	-0.854
0.401	-0.832	-0.848
0.426	-0.821	-0.837
0.450	-0.490	-0.499
0.475	-0.286	-0.291
0.501	-0.231	-0.236
0.525	-0.211	-0.215
0.550	-0.199	-0.203
0.575	-0.192	-0.195
0.600	-0.177	-0.180
0.625	-0.166	-0.170
0.650	-0.155	-0.158
0.675	-0.136	-0.139
0.700	-0.119	-0.121
0.725	-0.104	-0.106
0.750	-0.078	-0.079
0.775	-0.061	-0.062
0.800	-0.034	-0.034
0.825	-0.012	-0.012
0.850	0.016	0.017
0.875	0.047	0.047
0.900	0.081	0.082
0.925	0.118	0.121
0.950	0.159	0.163
0.975	0.204	0.208
1.000	0.265	0.270

Lower surface

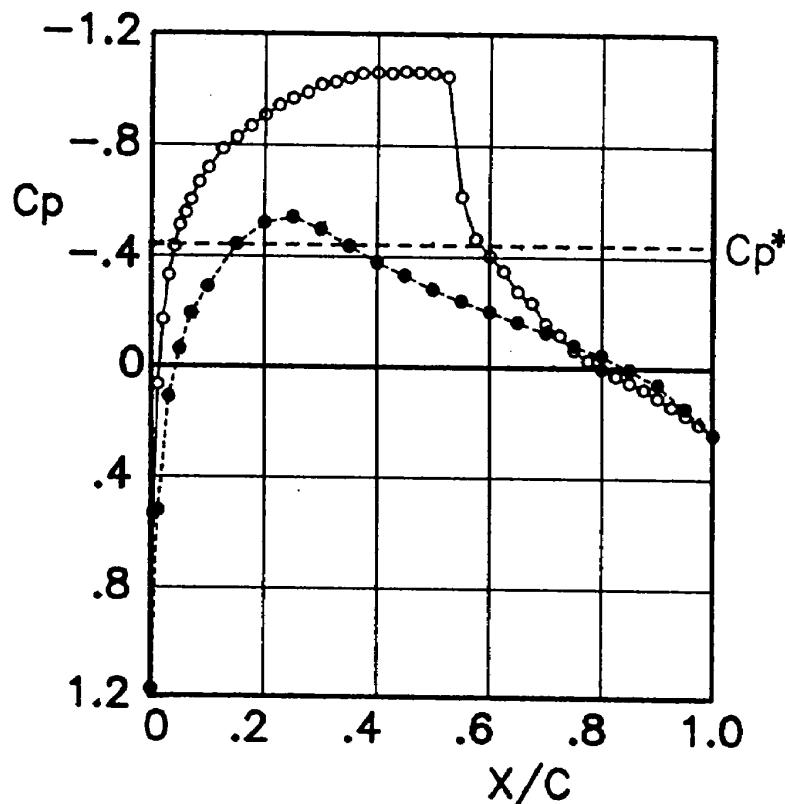
x/c	Cp	C _{Pc}
0.950	0.161	0.164
0.900	0.076	0.077
0.850	0.013	0.013
0.800	-0.039	-0.040
0.760	-0.080	-0.081
0.700	-0.123	-0.125
0.650	-0.156	-0.159
0.600	-0.178	-0.182
0.550	-0.200	-0.204
0.500	-0.248	-0.253
0.450	-0.536	-0.547
0.400	-0.841	-0.857
0.350	-0.837	-0.853
0.300	-0.822	-0.838
0.250	-0.780	-0.795
0.200	-0.737	-0.751
0.150	-0.655	-0.668
0.100	-0.502	-0.512
0.070	-0.411	-0.419
0.050	-0.289	-0.295
0.030	-0.130	-0.133
0.011	0.294	0.300

Fig. 21 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6925	2	0.822	0.799	1.01	14.9×10^6	0.148	0.151	0.0159

Fig. 22 Pressure distribution ($c = 250$ mm).

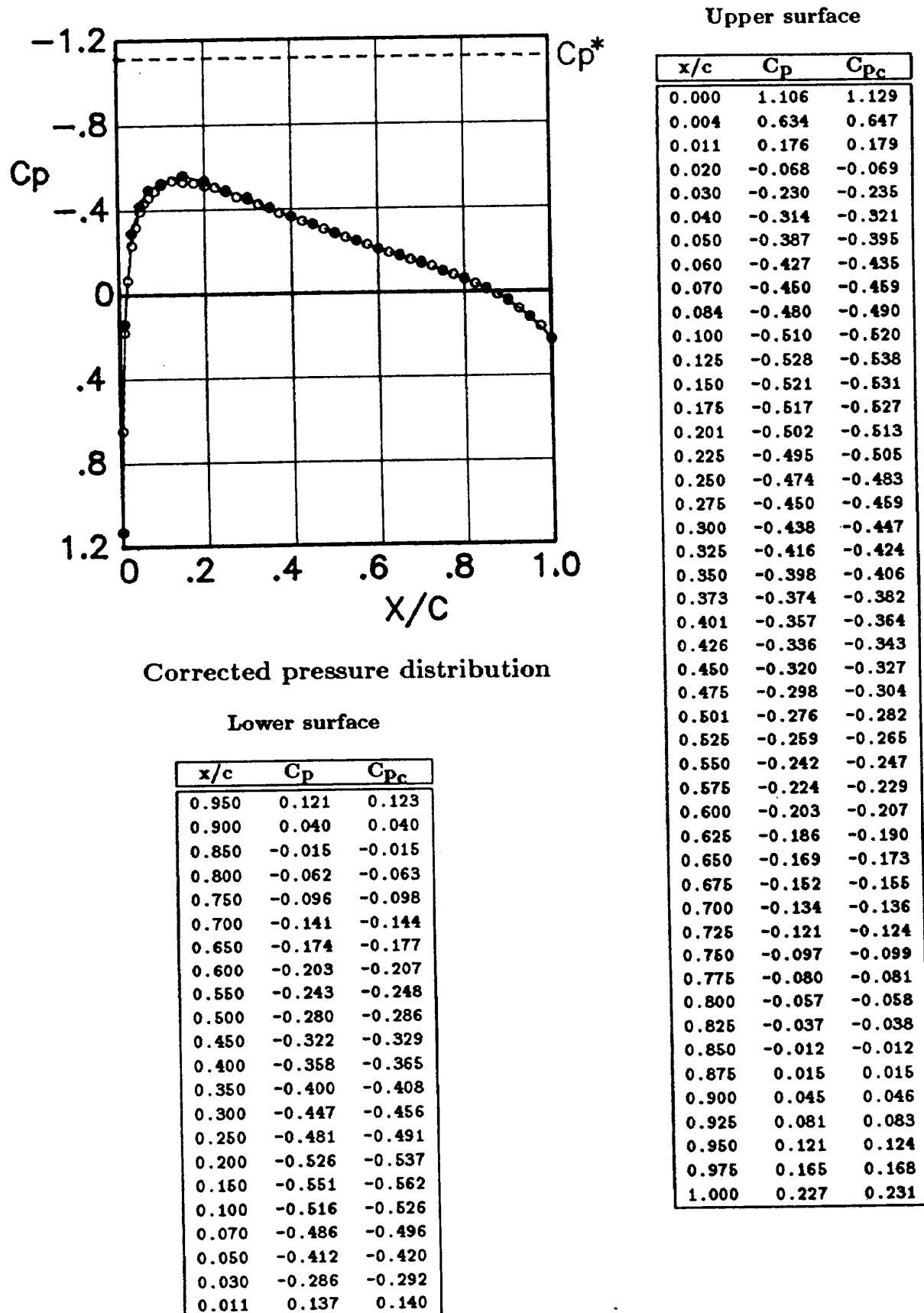
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6925	3	0.822	0.799	2.01	15.0×10^6	0.305	0.310	0.0260



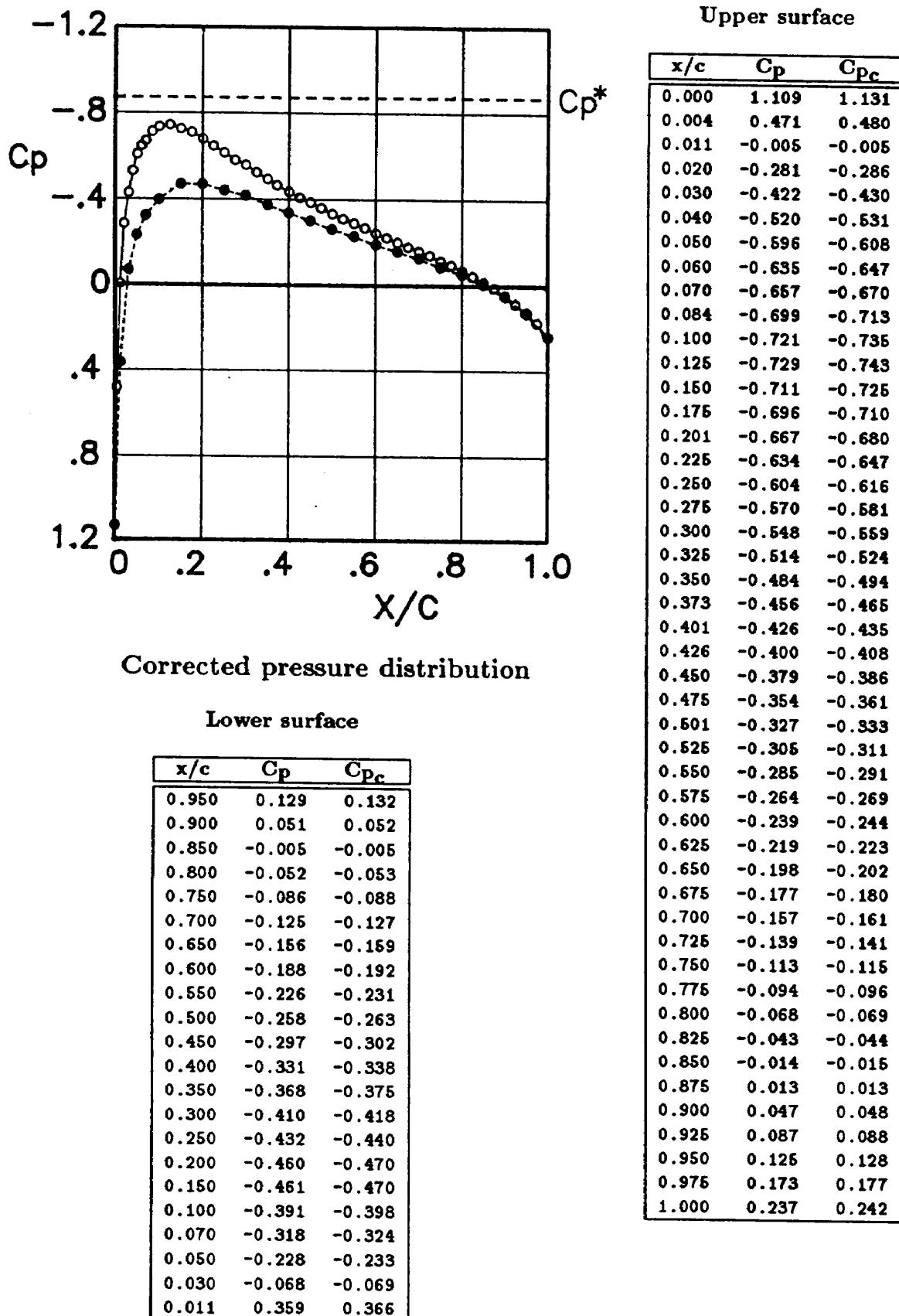
x/c	Cp	Cp _c
0.000	1.150	1.172
0.004	0.520	0.530
0.011	0.065	0.066
0.020	-0.167	-0.170
0.030	-0.325	-0.332
0.040	-0.427	-0.435
0.050	-0.502	-0.512
0.060	-0.547	-0.558
0.070	-0.592	-0.603
0.084	-0.654	-0.666
0.100	-0.705	-0.719
0.125	-0.771	-0.786
0.150	-0.814	-0.829
0.175	-0.853	-0.869
0.201	-0.892	-0.909
0.225	-0.927	-0.944
0.250	-0.951	-0.969
0.275	-0.972	-0.990
0.300	-1.000	-1.019
0.325	-1.009	-1.028
0.350	-1.024	-1.044
0.373	-1.039	-1.059
0.401	-1.042	-1.061
0.426	-1.039	-1.059
0.450	-1.046	-1.066
0.475	-1.043	-1.063
0.501	-1.041	-1.060
0.525	-1.029	-1.048
0.550	-0.605	-0.616
0.575	-0.457	-0.465
0.600	-0.396	-0.403
0.625	-0.343	-0.350
0.650	-0.271	-0.276
0.675	-0.231	-0.235
0.700	-0.155	-0.158
0.725	-0.116	-0.118
0.750	-0.063	-0.064
0.775	-0.026	-0.027
0.800	0.004	0.004
0.825	0.030	0.030
0.850	0.054	0.055
0.875	0.077	0.078
0.900	0.108	0.110
0.925	0.139	0.142
0.950	0.169	0.173
0.975	0.201	0.205
1.000	0.238	0.242

Fig. 23 Pressure distribution ($c = 250$ mm).

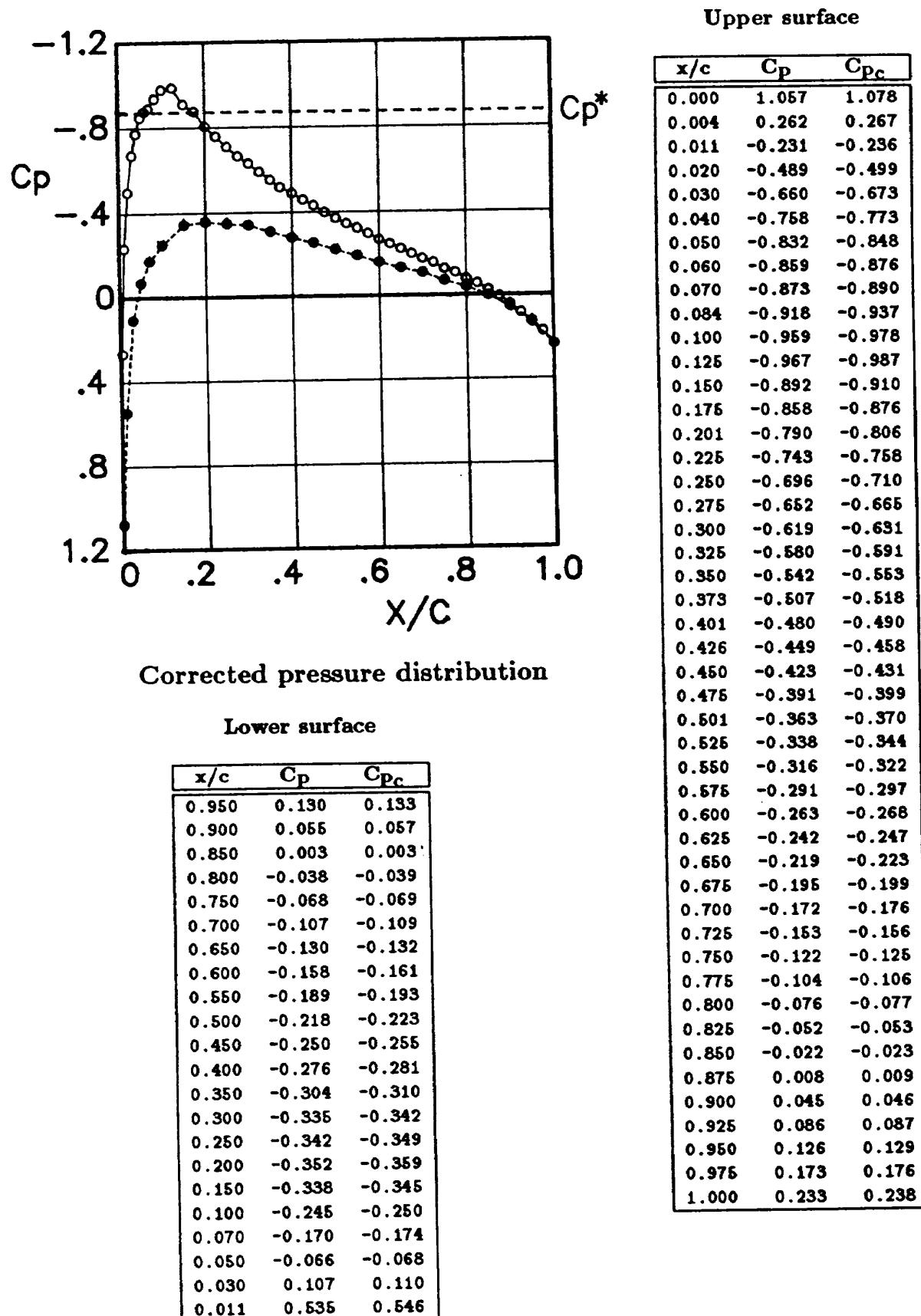
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6932	1	0.651	0.631	0.01	20.7×10^6	-0.006	-0.006	0.0068

Fig. 24 Pressure distribution ($c = 250$ mm).

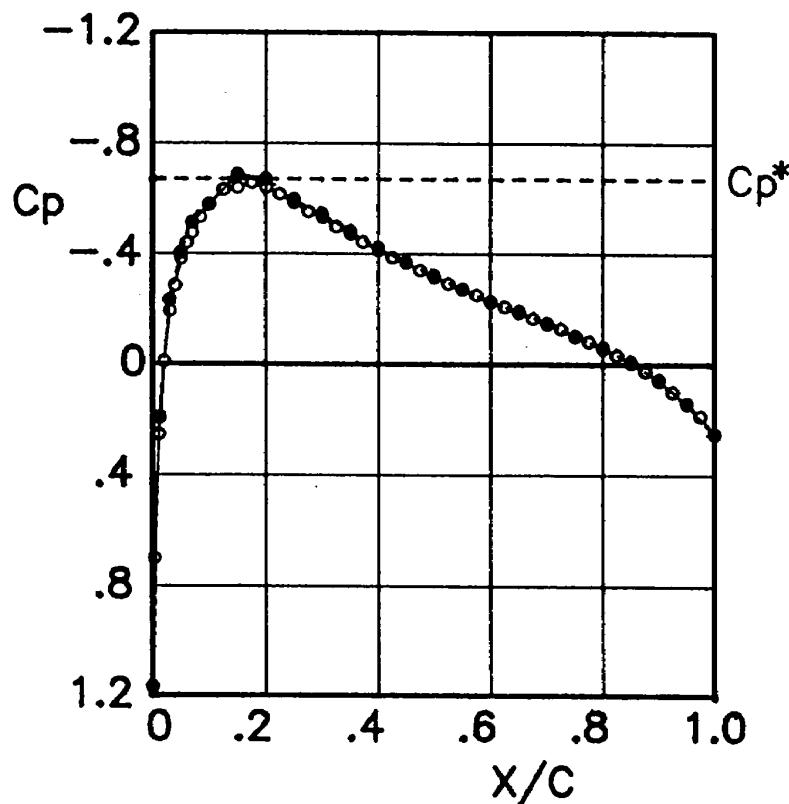
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6920	2	0.699	0.678	1.01	21.0×10^6	0.113	0.116	0.0070

Fig. 25 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6920	3	0.700	0.679	2.01	21.1×10^6	0.238	0.242	0.0070

Fig. 26 Pressure distribution ($c = 250$ mm).

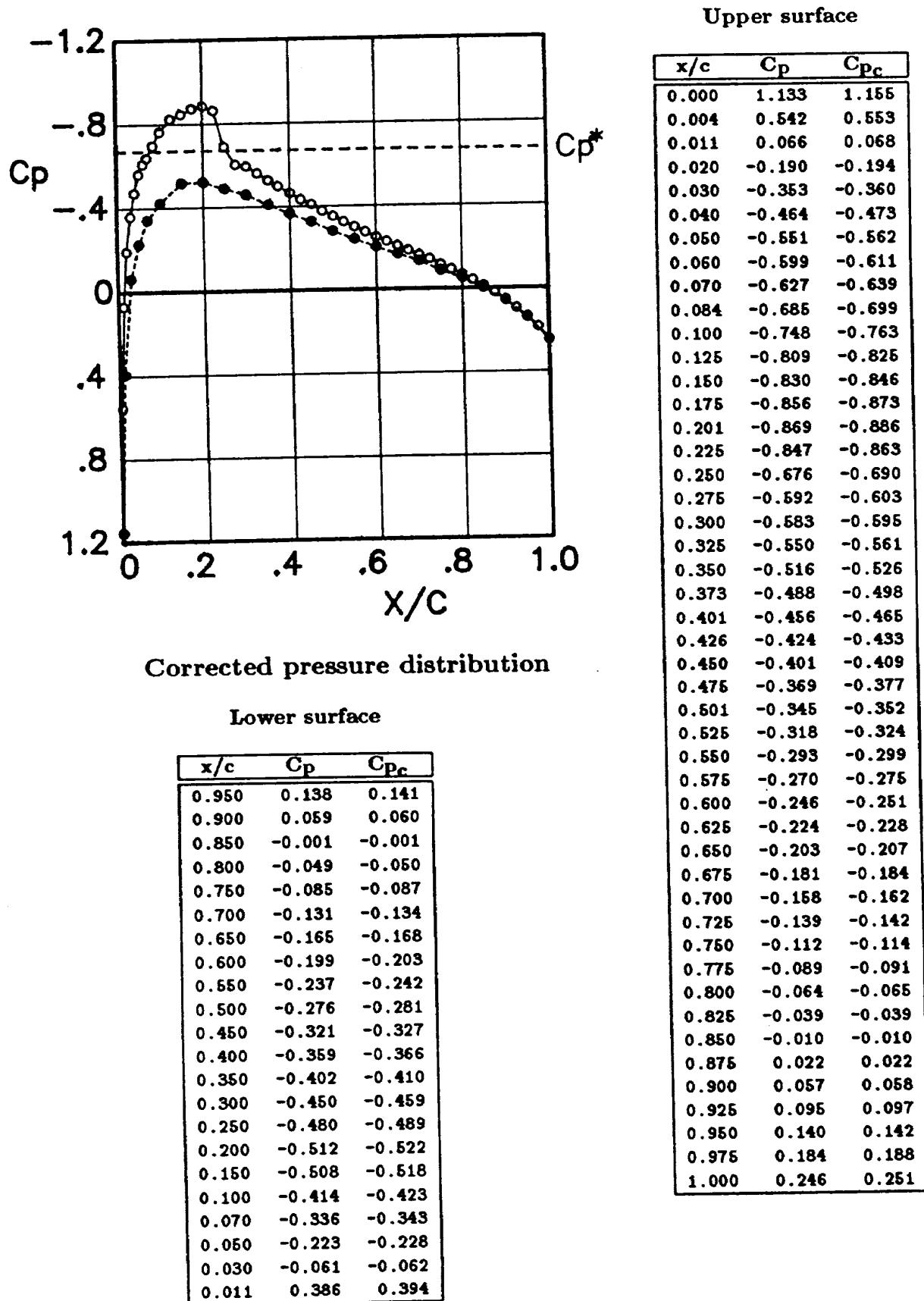
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6919	1	0.750	0.728	0.00	20.8×10^6	-0.008	-0.008	0.0071



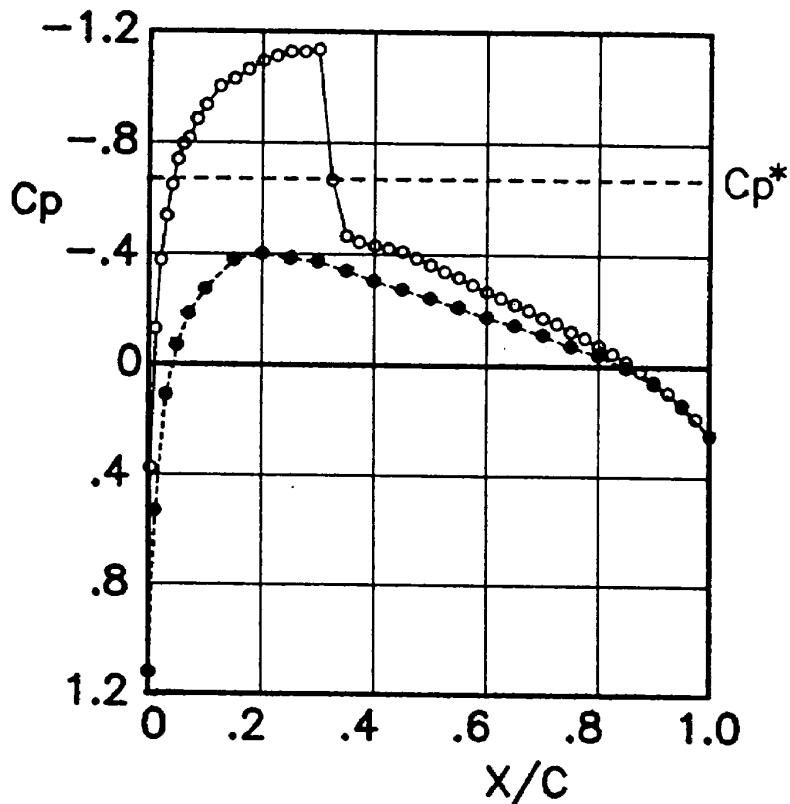
x/c	Cp	C _{Pc}
0.000	1.144	1.167
0.004	0.684	0.698
0.011	0.248	0.253
0.020	-0.010	-0.010
0.030	-0.190	-0.193
0.040	-0.280	-0.286
0.050	-0.375	-0.383
0.060	-0.431	-0.440
0.070	-0.467	-0.477
0.084	-0.522	-0.533
0.100	-0.568	-0.580
0.125	-0.620	-0.632
0.150	-0.628	-0.640
0.175	-0.645	-0.658
0.201	-0.628	-0.640
0.225	-0.605	-0.617
0.250	-0.574	-0.586
0.275	-0.542	-0.552
0.300	-0.521	-0.531
0.325	-0.489	-0.498
0.350	-0.463	-0.472
0.373	-0.434	-0.443
0.401	-0.405	-0.413
0.426	-0.380	-0.387
0.450	-0.361	-0.368
0.475	-0.334	-0.341
0.501	-0.309	-0.315
0.525	-0.287	-0.292
0.550	-0.267	-0.272
0.575	-0.246	-0.251
0.600	-0.221	-0.225
0.625	-0.204	-0.208
0.650	-0.183	-0.187
0.675	-0.162	-0.165
0.700	-0.142	-0.145
0.725	-0.125	-0.127
0.750	-0.100	-0.102
0.775	-0.079	-0.081
0.800	-0.054	-0.056
0.825	-0.032	-0.032
0.850	-0.004	-0.005
0.875	0.025	0.026
0.900	0.059	0.060
0.925	0.098	0.100
0.950	0.139	0.141
0.975	0.184	0.187
1.000	0.247	0.252

Fig. 27 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6919	2	0.750	0.728	1.00	21.0×10^6	0.121	0.123	0.0071

Fig. 28 Pressure distribution ($c = 250$ mm).

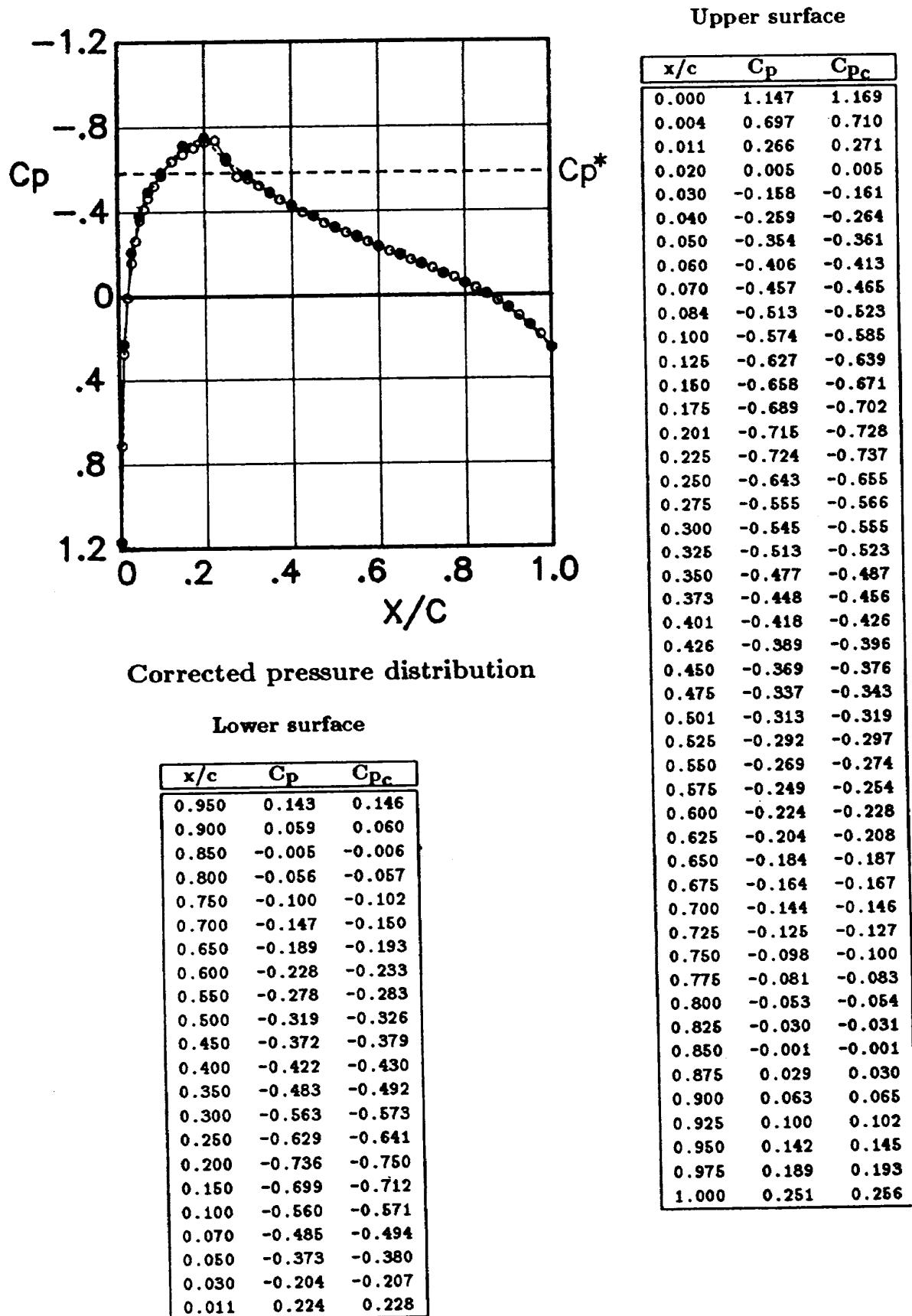
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6919	3	0.750	0.728	2.01	21.1×10^6	0.263	0.268	0.0090



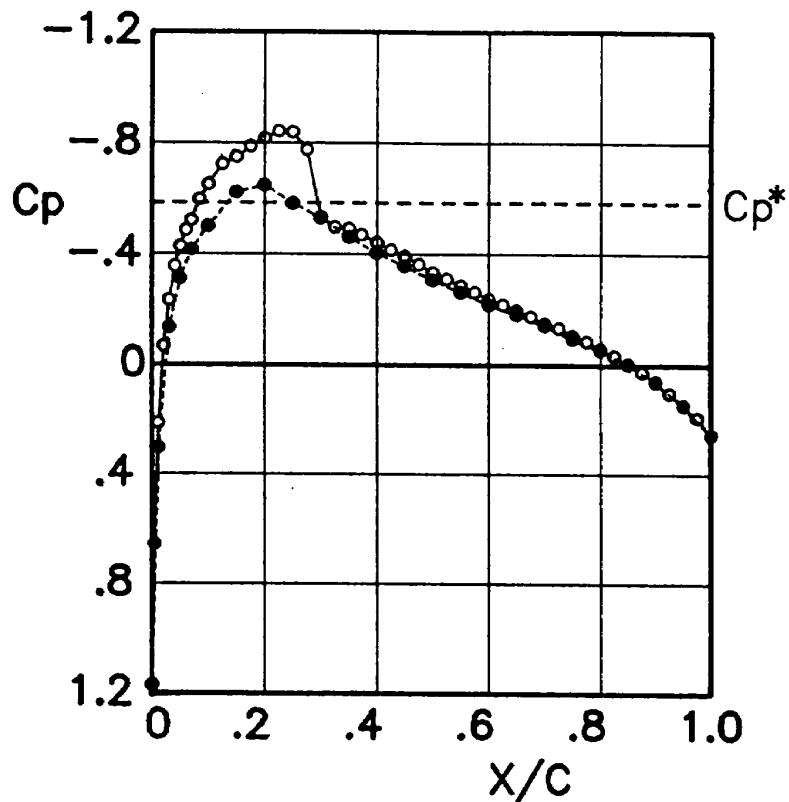
x/c	Cp	C _{Pc}
0.000	1.100	1.122
0.004	0.367	0.374
0.011	-0.126	-0.128
0.020	-0.370	-0.378
0.030	-0.526	-0.537
0.040	-0.636	-0.648
0.050	-0.725	-0.740
0.060	-0.780	-0.795
0.070	-0.802	-0.817
0.084	-0.867	-0.884
0.100	-0.918	-0.936
0.125	-0.983	-1.002
0.150	-1.009	-1.029
0.175	-1.043	-1.063
0.201	-1.074	-1.095
0.225	-1.091	-1.113
0.250	-1.105	-1.127
0.275	-1.106	-1.128
0.300	-1.114	-1.136
0.325	-0.653	-0.666
0.350	-0.456	-0.465
0.373	-0.434	-0.443
0.401	-0.422	-0.431
0.426	-0.412	-0.420
0.450	-0.401	-0.409
0.475	-0.378	-0.386
0.501	-0.354	-0.361
0.525	-0.331	-0.338
0.550	-0.311	-0.317
0.575	-0.286	-0.291
0.600	-0.260	-0.266
0.625	-0.238	-0.243
0.650	-0.215	-0.219
0.675	-0.195	-0.199
0.700	-0.168	-0.172
0.725	-0.149	-0.152
0.750	-0.120	-0.122
0.775	-0.098	-0.100
0.800	-0.072	-0.073
0.825	-0.043	-0.044
0.850	-0.014	-0.014
0.875	0.019	0.019
0.900	0.056	0.057
0.925	0.094	0.096
0.950	0.136	0.139
0.975	0.185	0.189
1.000	0.244	0.249

Fig. 29 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6941	1	0.775	0.753	0.00	20.3×10^6	-0.006	-0.006	0.0071

Fig. 30 Pressure distribution ($c = 250$ mm).

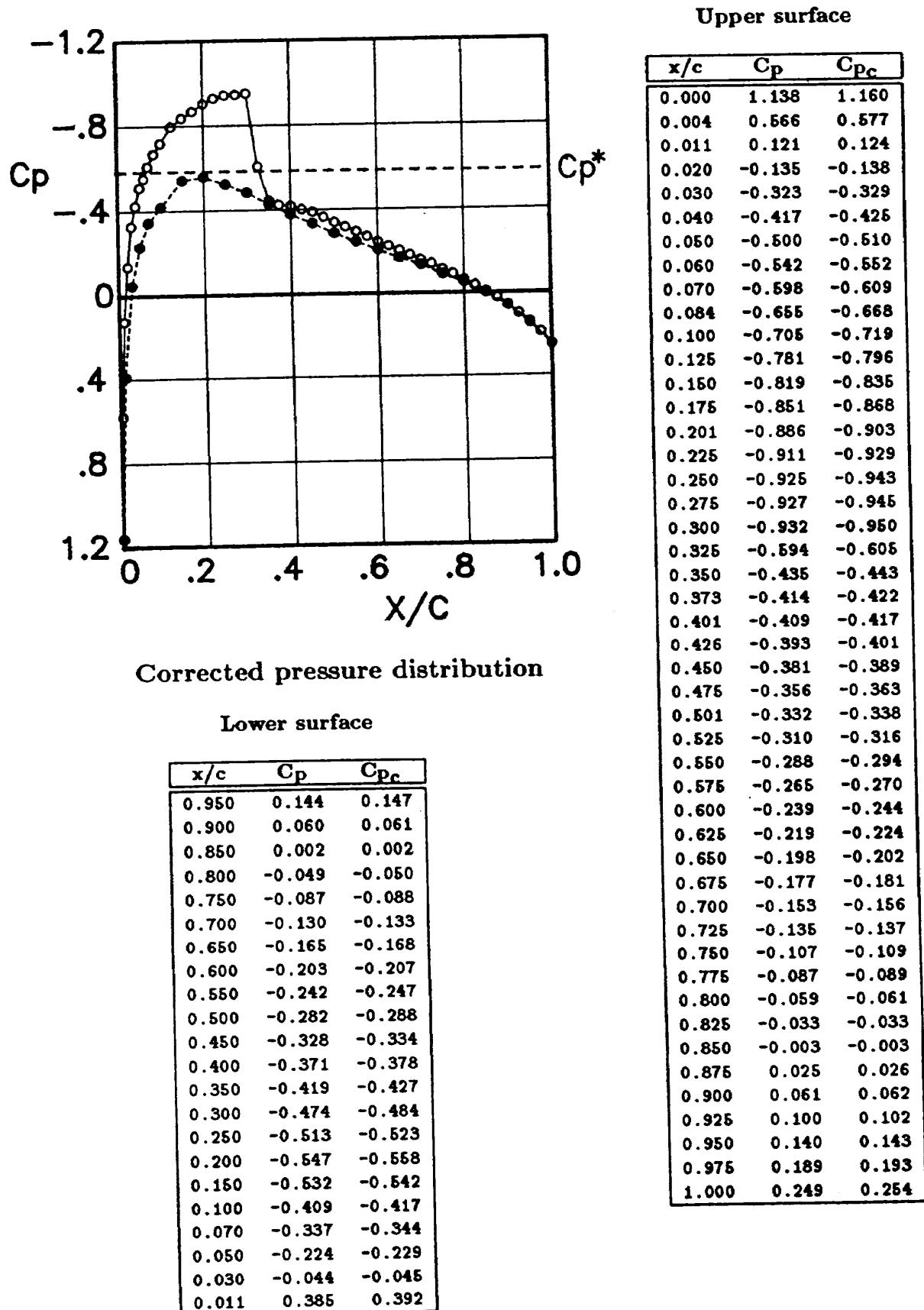
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6941	2	0.775	0.753	0.52	20.4×10^6	0.057	0.058	0.0074



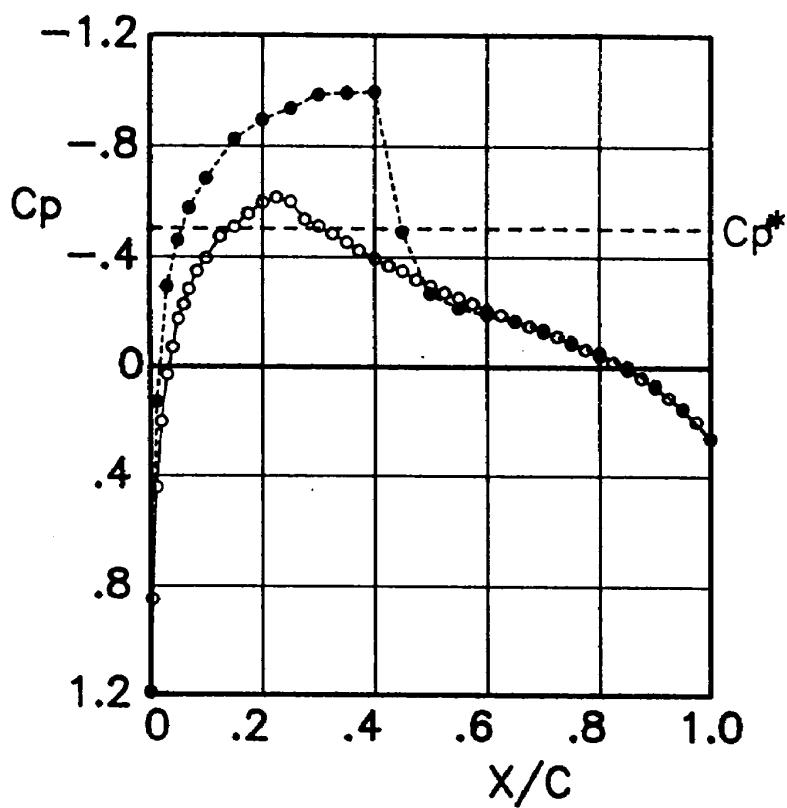
x/c	Cp	Cp _c
0.000	1.146	1.168
0.004	0.643	0.655
0.011	0.209	0.213
0.020	-0.066	-0.067
0.030	-0.230	-0.234
0.040	-0.350	-0.356
0.050	-0.420	-0.428
0.060	-0.476	-0.485
0.070	-0.512	-0.522
0.084	-0.585	-0.596
0.100	-0.638	-0.651
0.125	-0.710	-0.723
0.150	-0.735	-0.749
0.175	-0.772	-0.787
0.201	-0.802	-0.817
0.225	-0.827	-0.843
0.250	-0.824	-0.839
0.275	-0.761	-0.775
0.300	-0.524	-0.534
0.325	-0.487	-0.496
0.350	-0.482	-0.491
0.373	-0.460	-0.469
0.401	-0.433	-0.441
0.426	-0.407	-0.414
0.450	-0.384	-0.391
0.475	-0.356	-0.363
0.501	-0.328	-0.334
0.525	-0.305	-0.311
0.550	-0.281	-0.286
0.575	-0.258	-0.263
0.600	-0.233	-0.237
0.625	-0.213	-0.217
0.650	-0.193	-0.197
0.675	-0.171	-0.174
0.700	-0.146	-0.149
0.725	-0.130	-0.133
0.750	-0.103	-0.105
0.775	-0.083	-0.084
0.800	-0.056	-0.057
0.825	-0.032	-0.033
0.850	-0.002	-0.002
0.875	0.027	0.027
0.900	0.061	0.063
0.925	0.101	0.103
0.950	0.144	0.146
0.975	0.189	0.192
1.000	0.251	0.256

Fig. 31 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6941	3	0.775	0.753	1.01	20.5×10^6	0.125	0.127	0.0078

Fig. 32 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6908	1	0.801	0.778	-1.10	20.5×10^6	-0.163	-0.167	0.0127



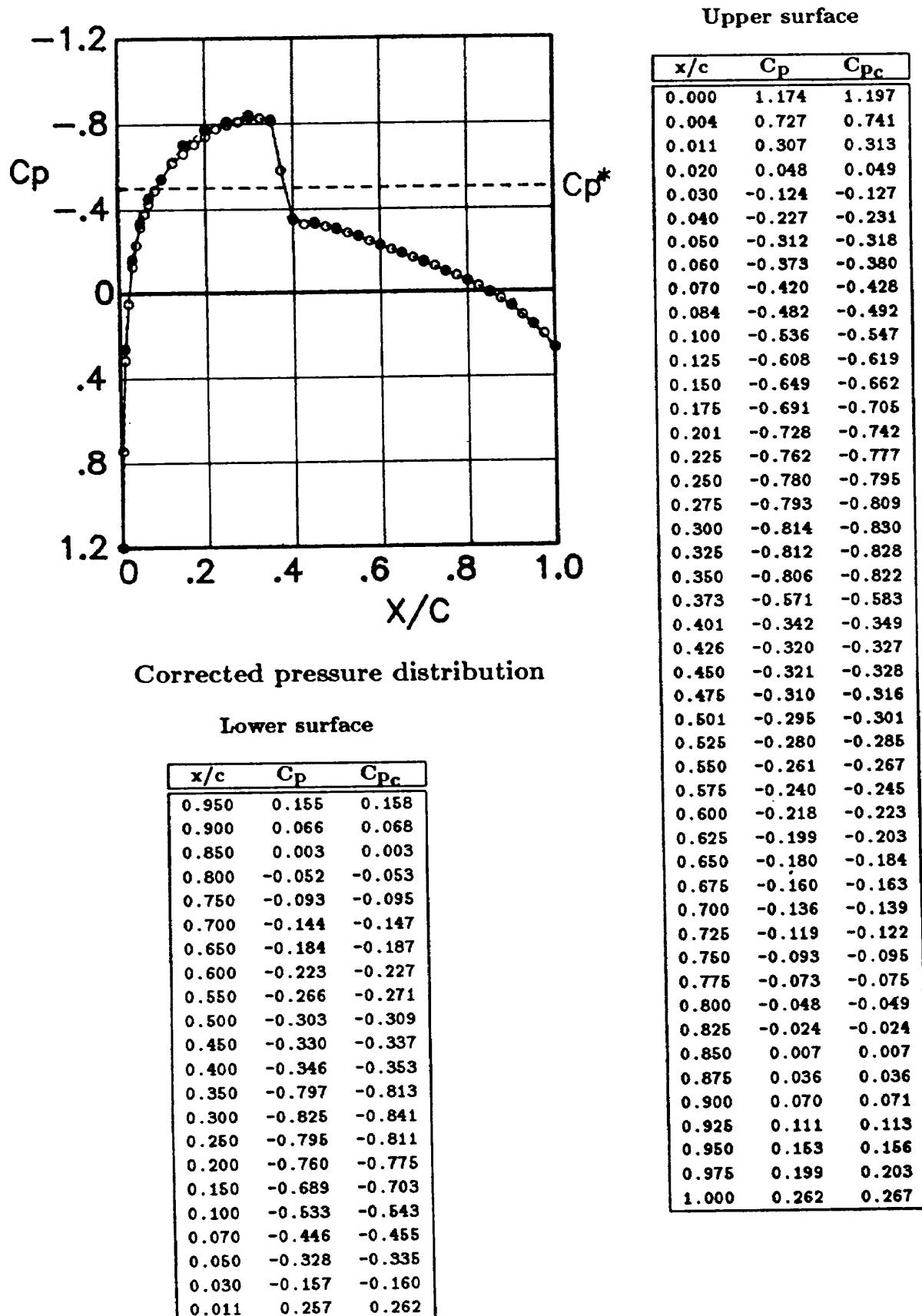
Corrected pressure distribution

Lower surface

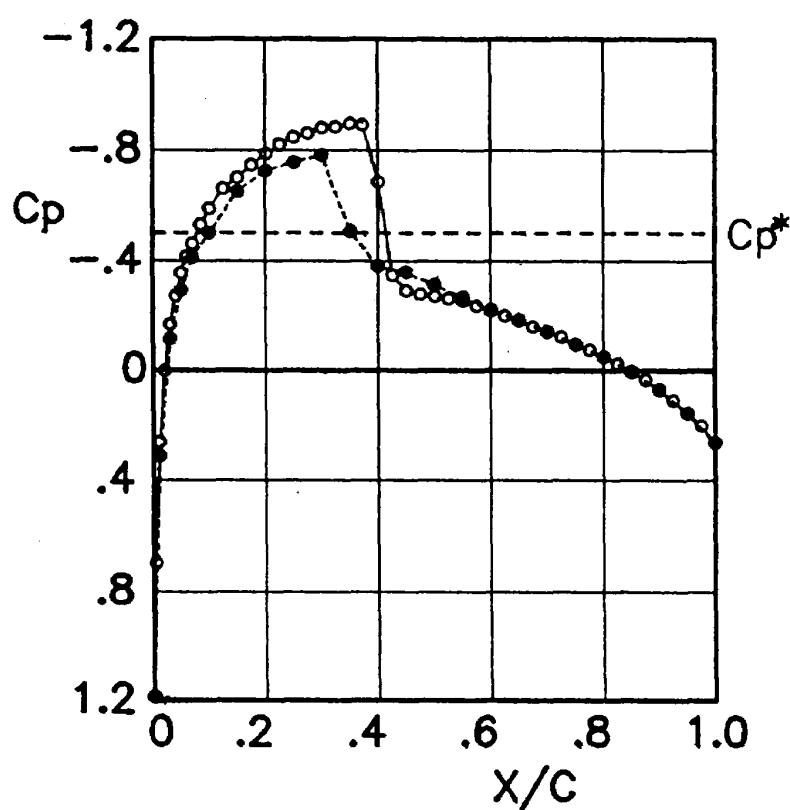
x/c	C_p	C_{p_c}
0.950	0.150	0.153
0.900	0.066	0.067
0.850	0.000	0.000
0.800	-0.051	-0.052
0.750	-0.089	-0.091
0.700	-0.134	-0.137
0.650	-0.164	-0.168
0.600	-0.189	-0.193
0.550	-0.211	-0.215
0.500	-0.264	-0.269
0.450	-0.482	-0.491
0.400	-0.977	-0.996
0.350	-0.972	-0.992
0.300	-0.966	-0.985
0.250	-0.917	-0.936
0.200	-0.877	-0.894
0.150	-0.808	-0.824
0.100	-0.669	-0.683
0.070	-0.565	-0.576
0.050	-0.451	-0.460
0.030	-0.287	-0.292
0.011	0.129	0.131

Fig. 33 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6910	1	0.801	0.778	0.00	20.2×10^6	-0.007	-0.007	0.0089

Fig. 34 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6908	3	0.801	0.778	0.41	20.8×10^6	0.051	0.052	0.0093

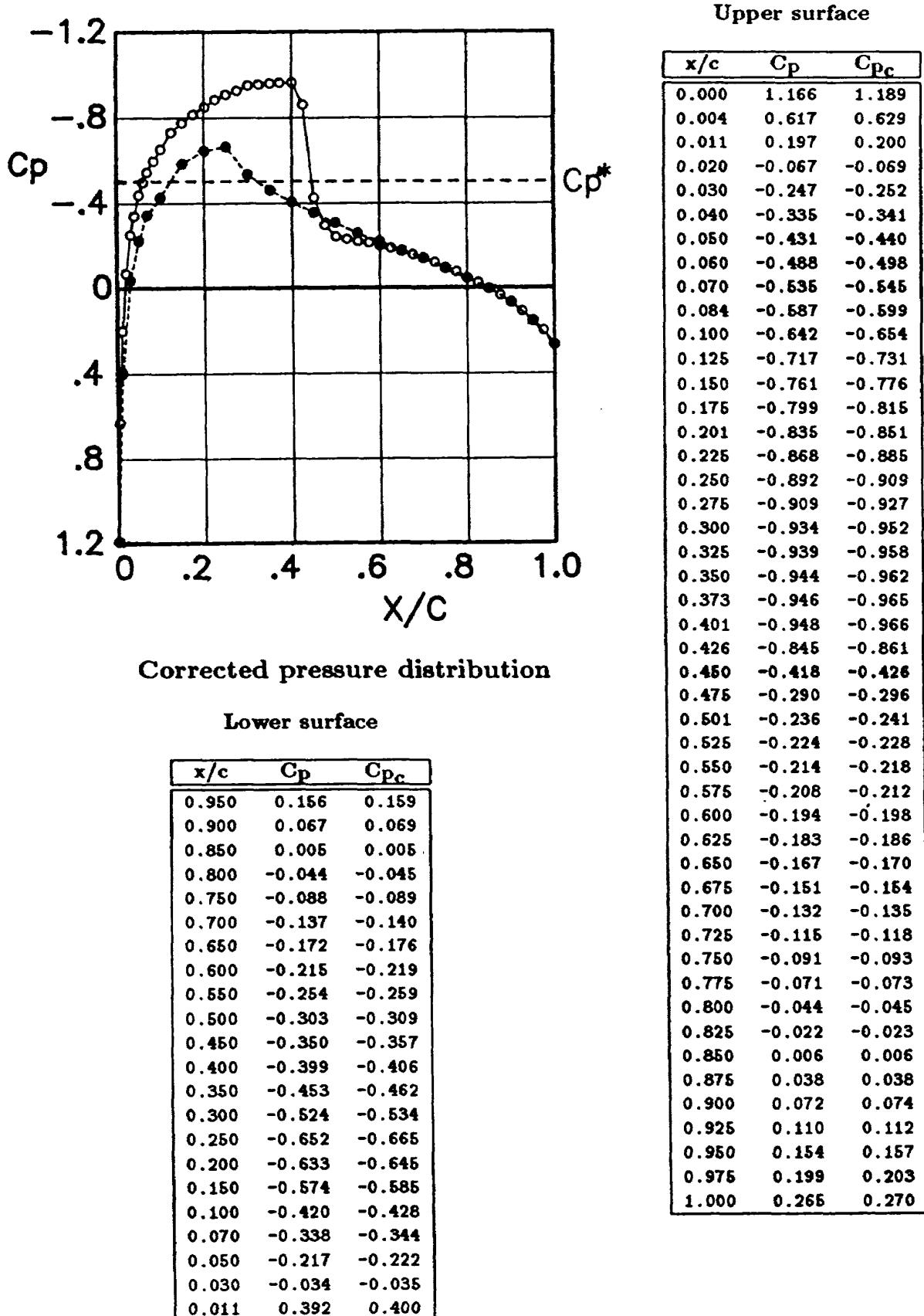


x/c	C _p	C _{p,c}
0.000	1.163	1.186
0.004	0.682	0.695
0.011	0.257	0.262
0.020	0.001	0.001
0.030	-0.166	-0.169
0.040	-0.269	-0.275
0.050	-0.350	-0.356
0.060	-0.410	-0.418
0.070	-0.455	-0.464
0.084	-0.523	-0.533
0.100	-0.579	-0.590
0.125	-0.650	-0.662
0.150	-0.689	-0.702
0.175	-0.734	-0.748
0.201	-0.774	-0.789
0.225	-0.807	-0.822
0.250	-0.831	-0.847
0.275	-0.845	-0.861
0.300	-0.865	-0.882
0.325	-0.868	-0.885
0.350	-0.879	-0.896
0.373	-0.875	-0.892
0.401	-0.674	-0.687
0.426	-0.342	-0.349
0.450	-0.287	-0.292
0.475	-0.274	-0.280
0.501	-0.268	-0.273
0.525	-0.259	-0.264
0.550	-0.250	-0.254
0.575	-0.232	-0.237
0.600	-0.214	-0.218
0.625	-0.197	-0.201
0.650	-0.179	-0.182
0.675	-0.157	-0.160
0.700	-0.137	-0.140
0.725	-0.120	-0.122
0.750	-0.094	-0.095
0.775	-0.072	-0.073
0.800	-0.046	-0.047
0.825	-0.022	-0.023
0.850	0.007	0.008
0.875	0.035	0.036
0.900	0.072	0.074
0.925	0.110	0.112
0.950	0.153	0.156
0.975	0.200	0.203
1.000	0.260	0.265

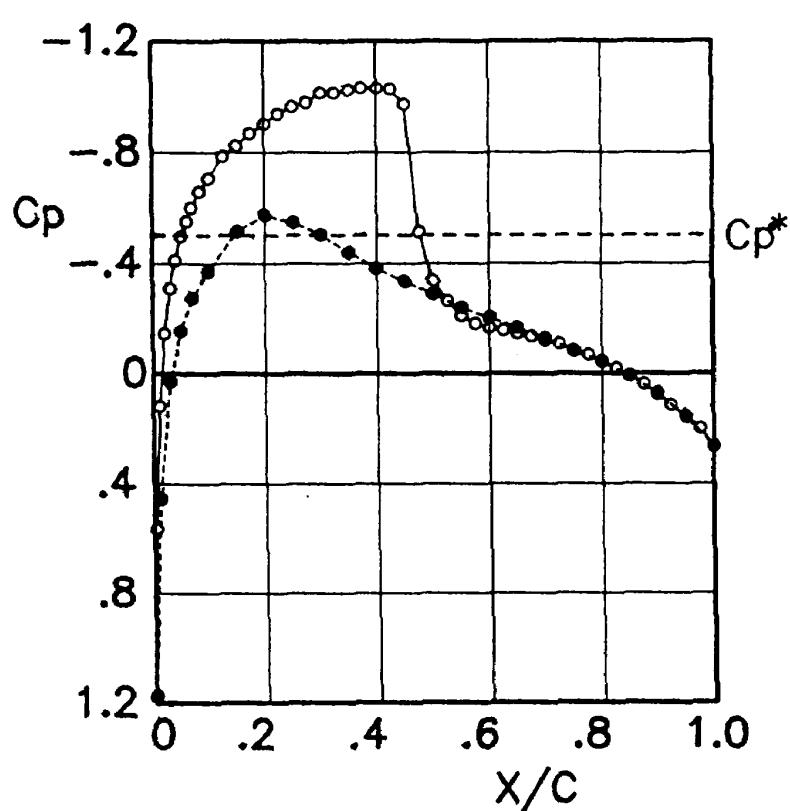
x/c	C _p	C _{p,c}
0.950	0.154	0.157
0.900	0.068	0.069
0.850	0.004	0.004
0.800	-0.050	-0.051
0.750	-0.092	-0.094
0.700	-0.141	-0.144
0.650	-0.183	-0.186
0.600	-0.221	-0.225
0.550	-0.266	-0.271
0.500	-0.310	-0.316
0.450	-0.353	-0.360
0.400	-0.375	-0.383
0.350	-0.499	-0.509
0.300	-0.768	-0.783
0.250	-0.742	-0.756
0.200	-0.714	-0.727
0.150	-0.640	-0.652
0.100	-0.492	-0.501
0.070	-0.405	-0.413
0.050	-0.289	-0.294
0.030	-0.112	-0.114
0.011	0.309	0.315

Fig. 35 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6909	1	0.801	0.778	0.91	20.6×10^6	0.132	0.134	0.0109

Fig. 36 Pressure distribution ($c = 250$ mm).

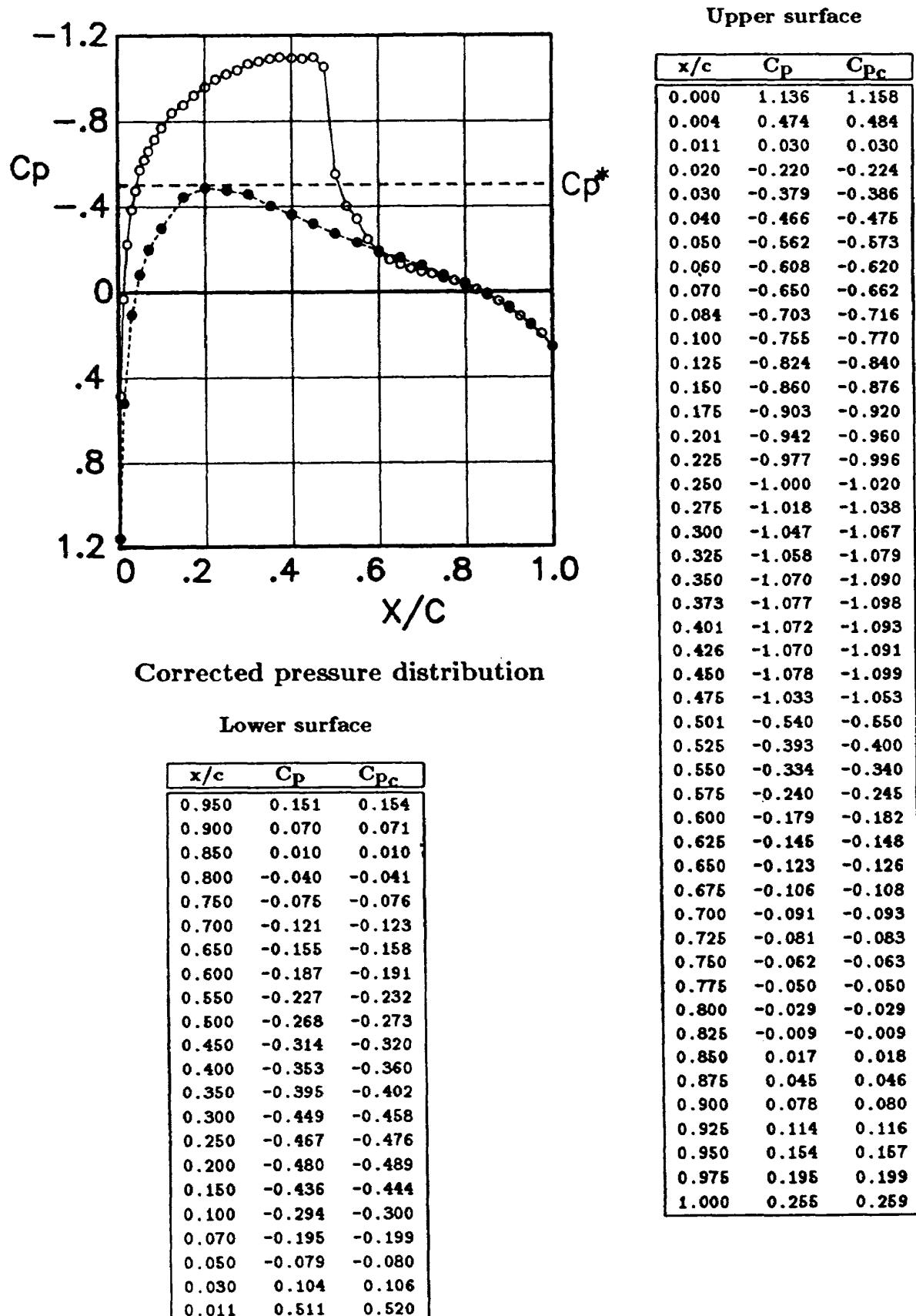
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	C_{d_wake}
6909	2	0.801	0.778	1.41	20.6×10^6	0.204	0.208	0.0139



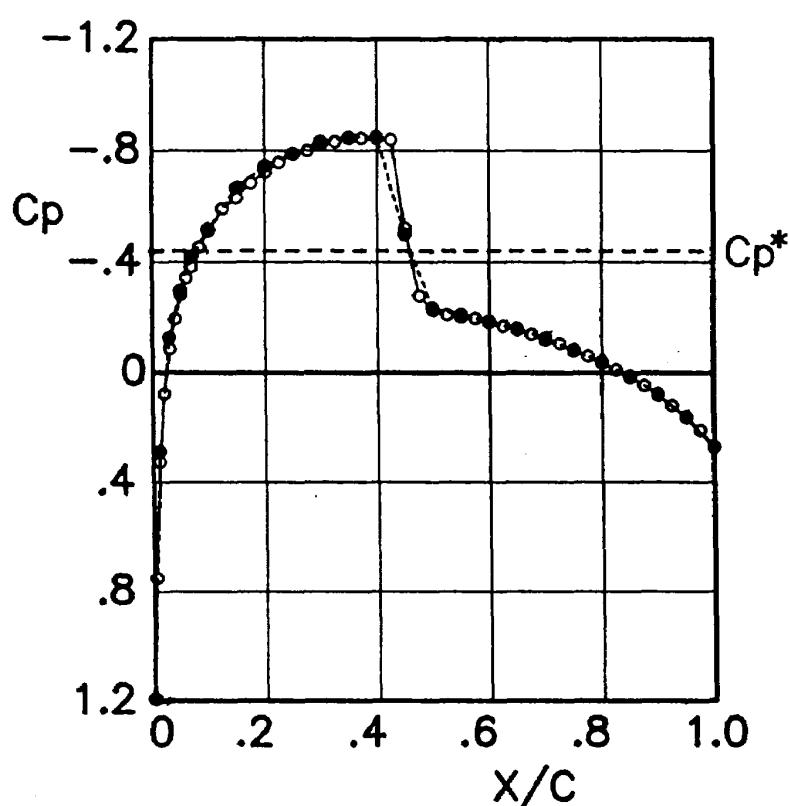
x/c	C _p	C _{p_c}
0.000	1.151	1.173
0.004	0.551	0.562
0.011	0.115	0.117
0.020	-0.145	-0.147
0.030	-0.305	-0.311
0.040	-0.404	-0.412
0.050	-0.489	-0.499
0.060	-0.542	-0.553
0.070	-0.591	-0.602
0.084	-0.648	-0.660
0.100	-0.694	-0.708
0.125	-0.771	-0.786
0.150	-0.809	-0.825
0.175	-0.852	-0.869
0.201	-0.886	-0.903
0.225	-0.922	-0.940
0.250	-0.947	-0.965
0.275	-0.962	-0.980
0.300	-0.996	-1.015
0.325	-0.996	-1.015
0.350	-1.006	-1.026
0.373	-1.012	-1.032
0.401	-1.012	-1.031
0.426	-1.009	-1.028
0.450	-0.956	-0.974
0.475	-0.505	-0.515
0.501	-0.331	-0.338
0.525	-0.259	-0.264
0.550	-0.205	-0.209
0.575	-0.177	-0.181
0.600	-0.162	-0.165
0.625	-0.153	-0.156
0.650	-0.141	-0.144
0.675	-0.132	-0.134
0.700	-0.117	-0.119
0.725	-0.105	-0.107
0.750	-0.081	-0.083
0.775	-0.066	-0.067
0.800	-0.040	-0.040
0.825	-0.017	-0.017
0.850	0.009	0.010
0.875	0.040	0.040
0.900	0.076	0.077
0.925	0.114	0.117
0.950	0.154	0.157
0.975	0.197	0.201
1.000	0.260	0.265

Fig. 37 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6910	2	0.801	0.778	1.91	20.3×10^6	0.285	0.290	0.0187

Fig. 38 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6918	2	0.823	0.800	0.00	20.8×10^6	-0.004	-0.004	0.0126



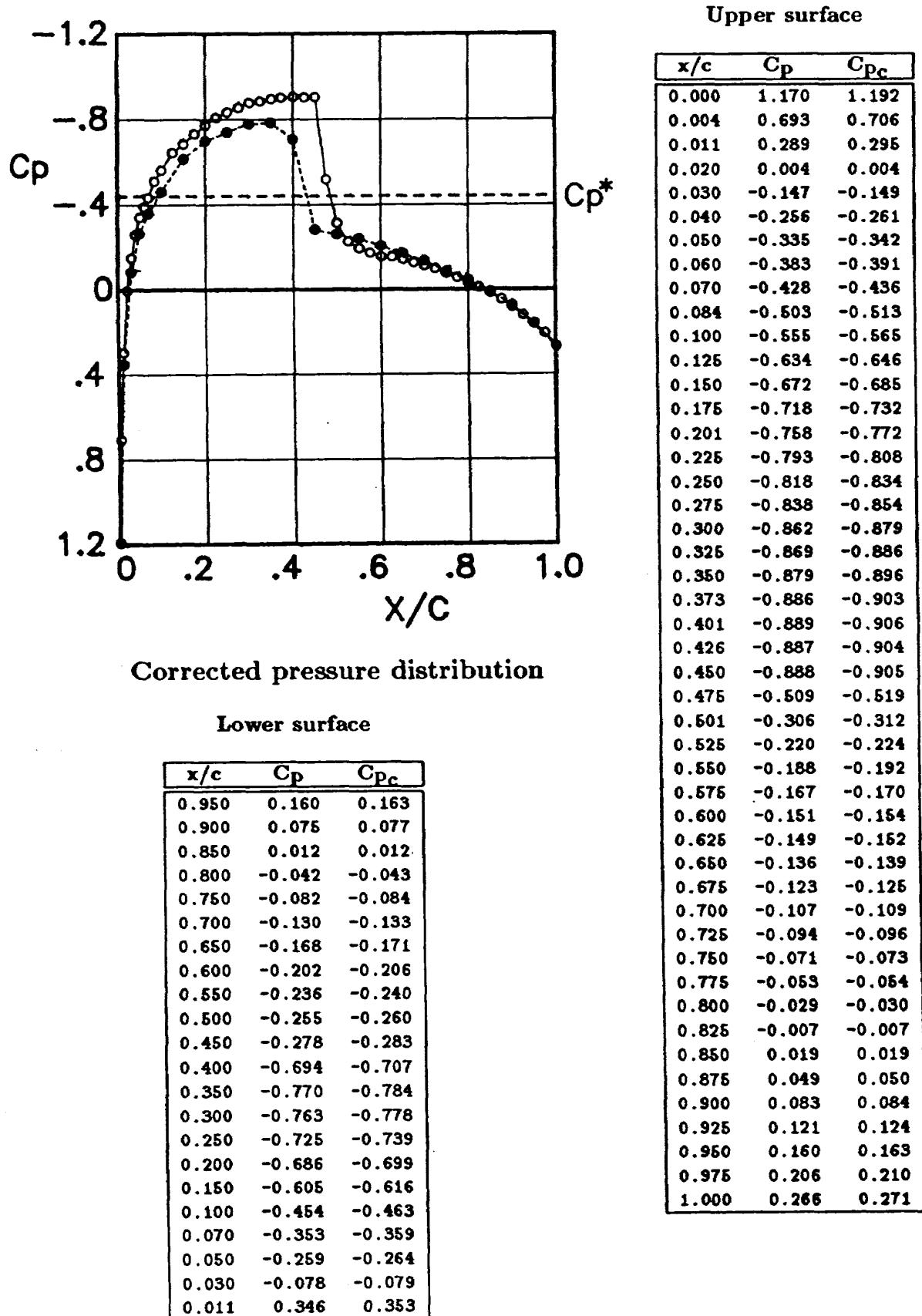
x/c	Cp	C _{Pc}
0.000	1.170	1.192
0.004	0.737	0.781
0.011	0.320	0.326
0.020	0.075	0.076
0.030	-0.085	-0.087
0.040	-0.192	-0.195
0.050	-0.279	-0.284
0.060	-0.337	-0.343
0.070	-0.377	-0.384
0.084	-0.445	-0.454
0.100	-0.501	-0.511
0.125	-0.580	-0.591
0.150	-0.618	-0.630
0.175	-0.671	-0.684
0.201	-0.709	-0.723
0.225	-0.744	-0.758
0.250	-0.772	-0.787
0.275	-0.785	-0.800
0.300	-0.810	-0.825
0.325	-0.818	-0.833
0.350	-0.830	-0.845
0.373	-0.830	-0.846
0.401	-0.828	-0.843
0.426	-0.825	-0.840
0.450	-0.511	-0.521
0.475	-0.273	-0.278
0.501	-0.221	-0.226
0.525	-0.205	-0.209
0.550	-0.197	-0.201
0.575	-0.192	-0.196
0.600	-0.178	-0.182
0.625	-0.165	-0.168
0.650	-0.152	-0.155
0.675	-0.135	-0.138
0.700	-0.115	-0.117
0.725	-0.103	-0.105
0.750	-0.076	-0.078
0.775	-0.058	-0.059
0.800	-0.033	-0.034
0.825	-0.009	-0.009
0.850	0.018	0.018
0.875	0.048	0.049
0.900	0.081	0.083
0.925	0.119	0.122
0.950	0.161	0.164
0.975	0.208	0.212
1.000	0.268	0.273

Lower surface

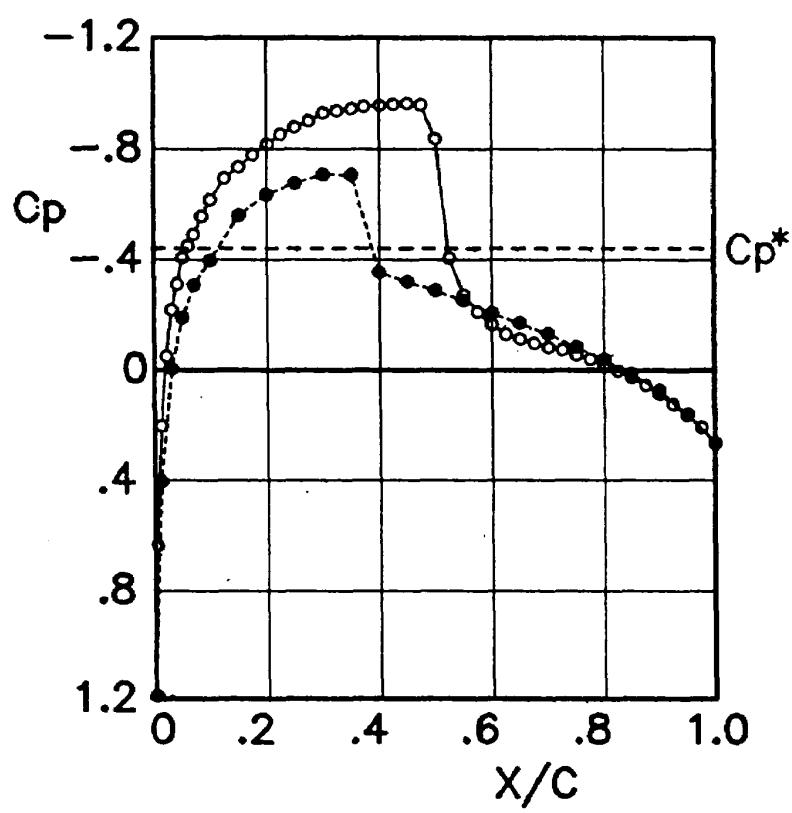
x/c	Cp	C _{Pc}
0.950	0.160	0.163
0.900	0.076	0.077
0.850	0.013	0.013
0.800	-0.039	-0.039
0.750	-0.081	-0.082
0.700	-0.124	-0.126
0.650	-0.156	-0.159
0.600	-0.184	-0.188
0.550	-0.207	-0.210
0.500	-0.230	-0.234
0.450	-0.490	-0.499
0.400	-0.835	-0.851
0.350	-0.833	-0.848
0.300	-0.817	-0.833
0.250	-0.776	-0.790
0.200	-0.732	-0.745
0.150	-0.654	-0.666
0.100	-0.506	-0.515
0.070	-0.410	-0.418
0.050	-0.291	-0.296
0.030	-0.123	-0.126
0.011	0.284	0.289

Fig. 39 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6936	2	0.822	0.799	0.51	20.5×10^6	0.065	0.067	0.0130

Fig. 40 Pressure distribution ($c = 250$ mm).

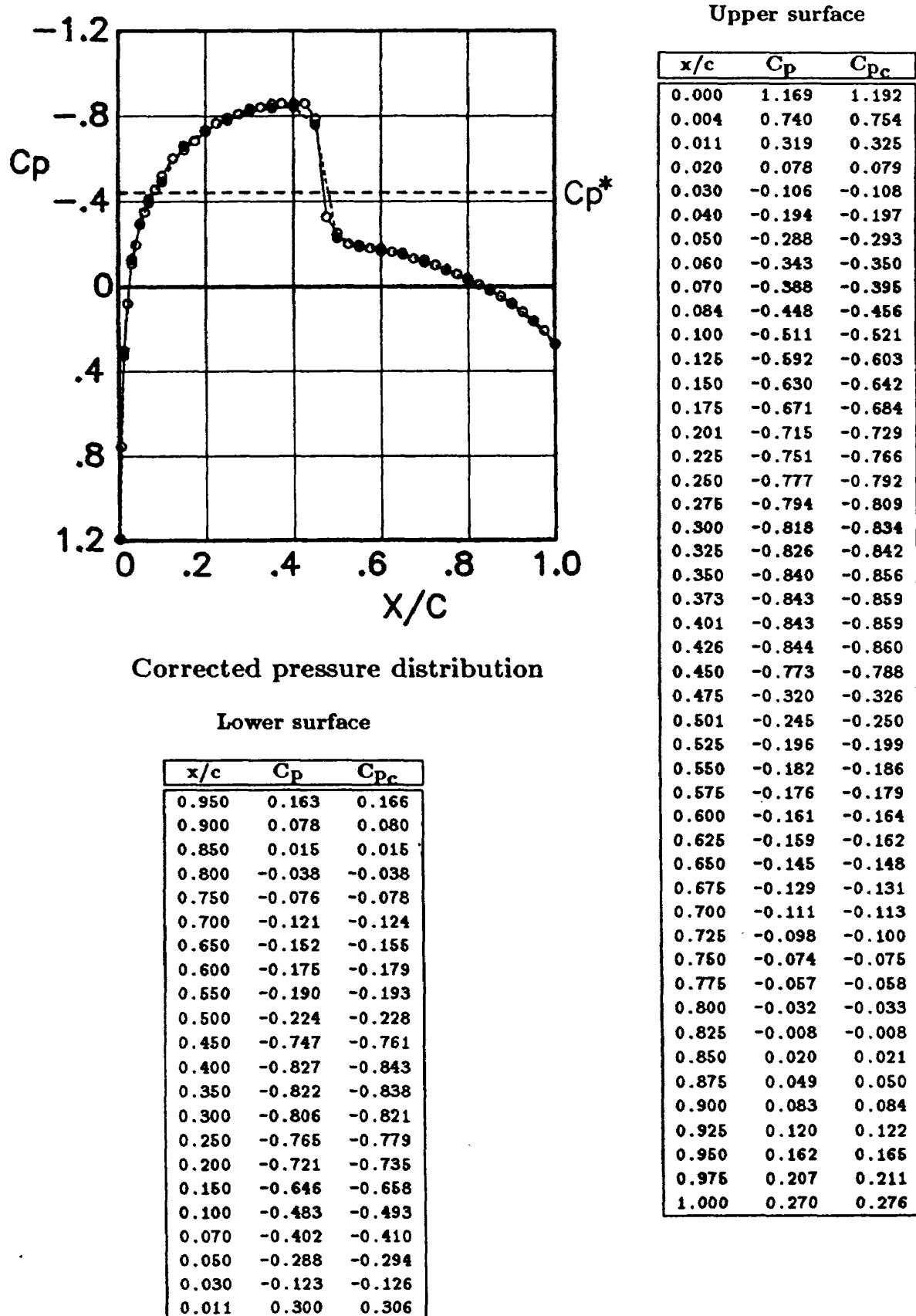
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6918	3	0.822	0.799	1.01	20.9×10^6	0.152	0.155	0.0156



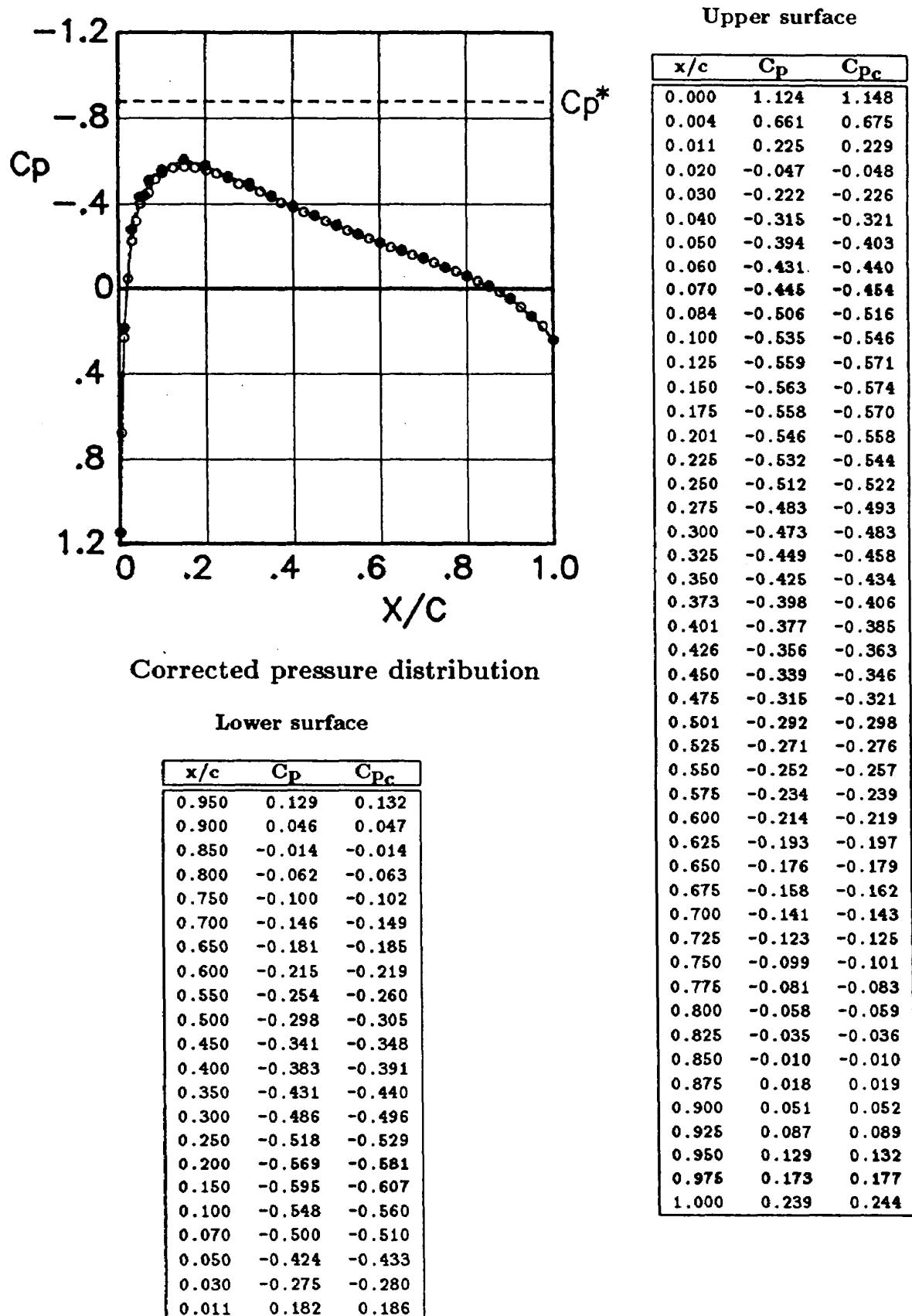
x/c	C_p	C_{p_c}
0.000	1.165	1.188
0.004	0.622	0.634
0.011	0.201	0.205
0.020	-0.050	-0.051
0.030	-0.215	-0.219
0.040	-0.306	-0.312
0.050	-0.400	-0.408
0.060	-0.442	-0.450
0.070	-0.483	-0.492
0.084	-0.547	-0.558
0.100	-0.605	-0.617
0.125	-0.681	-0.694
0.150	-0.722	-0.736
0.175	-0.764	-0.779
0.201	-0.803	-0.819
0.225	-0.838	-0.854
0.250	-0.863	-0.880
0.275	-0.886	-0.903
0.300	-0.914	-0.932
0.325	-0.921	-0.939
0.350	-0.929	-0.947
0.373	-0.937	-0.956
0.401	-0.941	-0.959
0.426	-0.944	-0.963
0.450	-0.948	-0.966
0.475	-0.943	-0.961
0.501	-0.823	-0.839
0.525	-0.398	-0.406
0.550	-0.266	-0.271
0.575	-0.206	-0.210
0.600	-0.161	-0.164
0.625	-0.126	-0.129
0.650	-0.110	-0.112
0.675	-0.095	-0.097
0.700	-0.081	-0.082
0.725	-0.072	-0.073
0.750	-0.053	-0.054
0.775	-0.039	-0.039
0.800	-0.017	-0.017
0.825	0.004	0.004
0.850	0.028	0.028
0.875	0.056	0.057
0.900	0.088	0.090
0.925	0.125	0.127
0.950	0.165	0.168
0.975	0.208	0.212
1.000	0.264	0.269

Fig. 41 Pressure distribution ($c = 250$ mm).

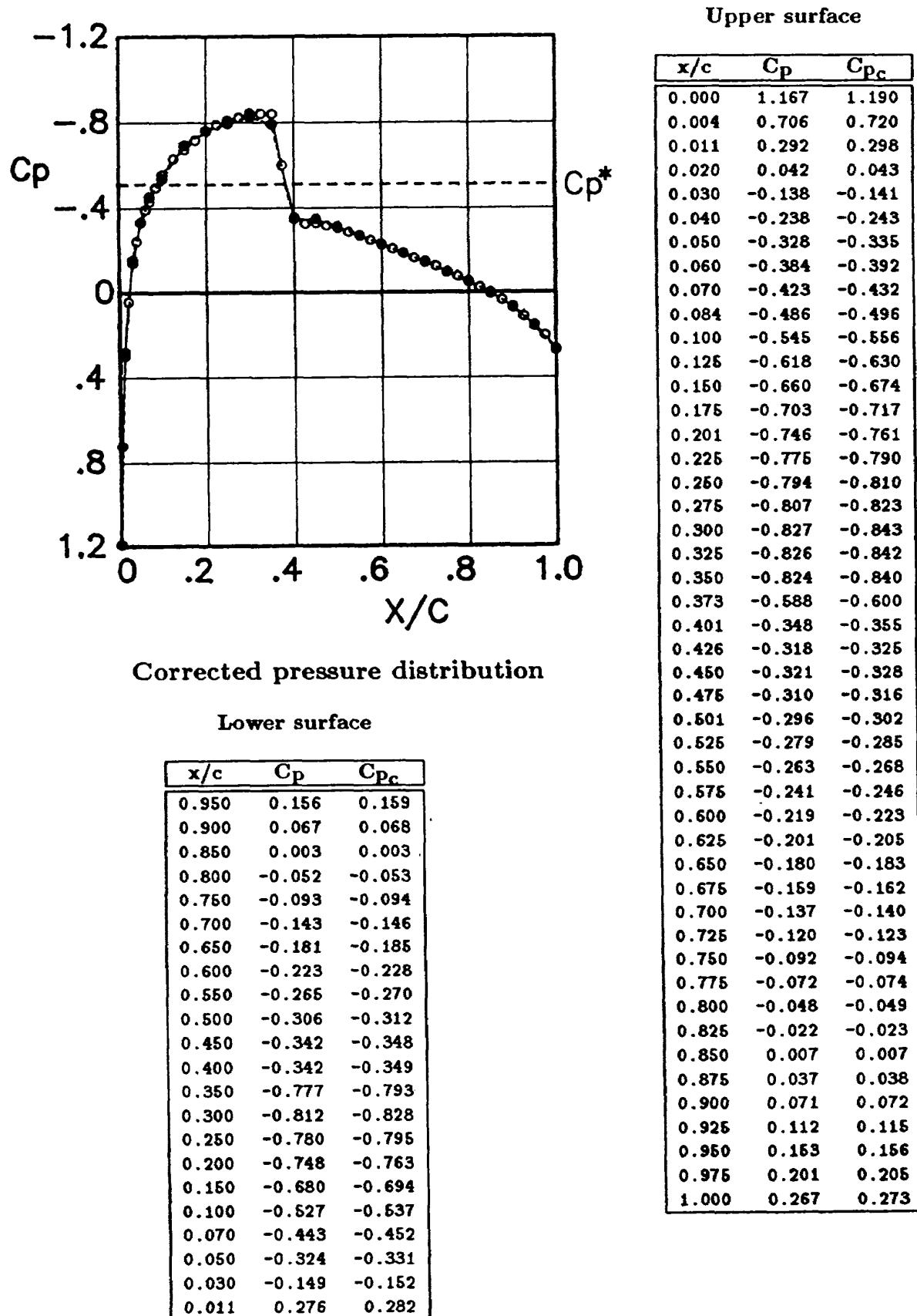
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6940	1	0.822	0.799	0.01	29.1×10^6	0.000	0.000	0.0133

Fig. 42 Pressure distribution ($c = 250$ mm).

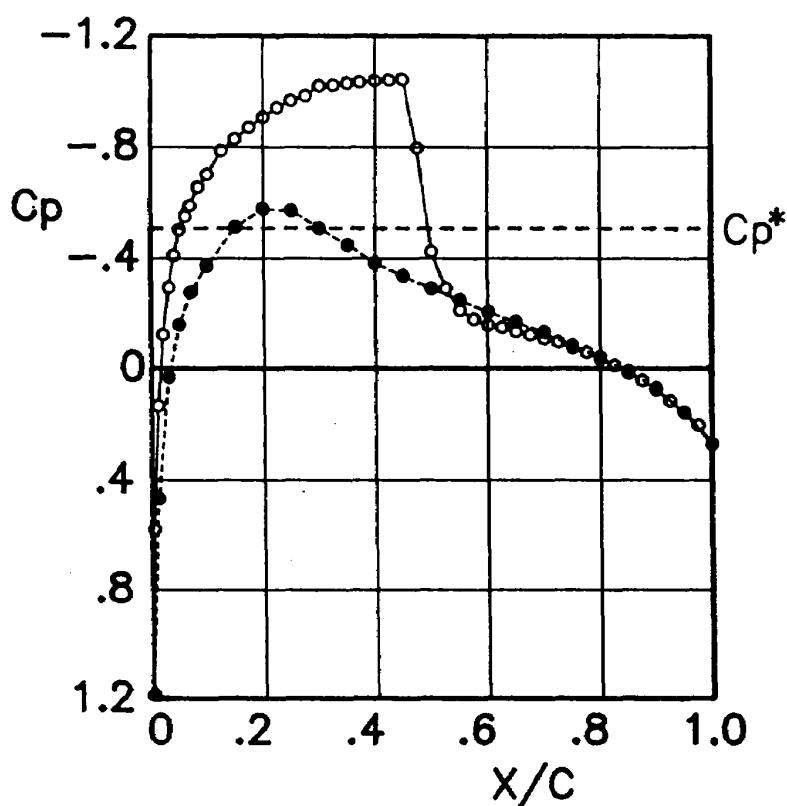
Run	Scan	M_s	M_c	α_s (deg.)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6939	1	0.699	0.678	0.01	38.8×10^6	-0.008	-0.008	0.0066

Fig. 43 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6938	1	0.799	0.776	0.01	39.5×10^6	0.002	0.002	0.0083

Fig. 44 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6930	1	0.800	0.777	1.42	39.5×10^6	0.212	0.216	0.0149



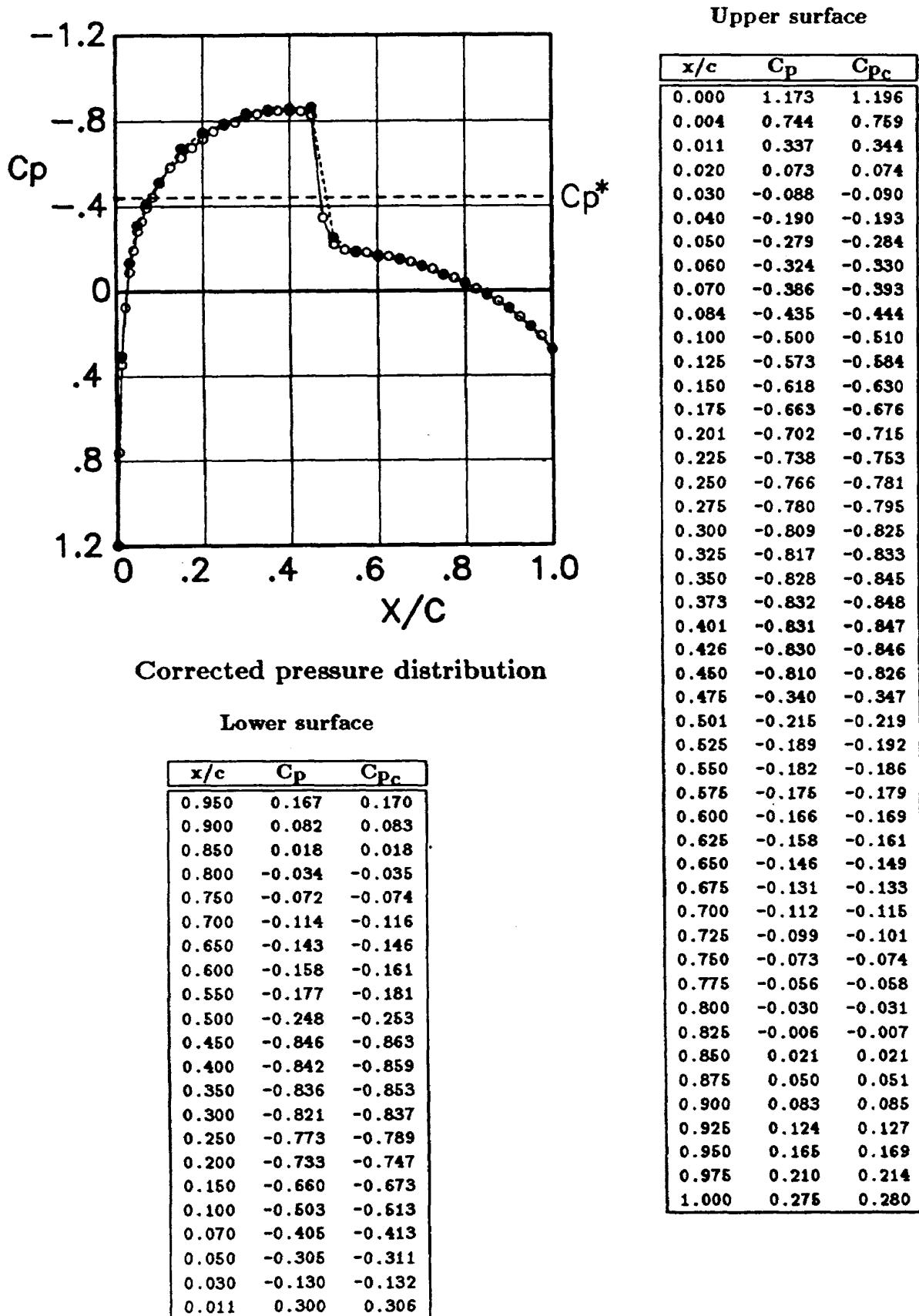
Corrected pressure distribution

Lower surface

x/c	Cp	Cp _c
0.950	0.156	0.159
0.900	0.069	0.071
0.850	0.009	0.010
0.800	-0.041	-0.042
0.750	-0.081	-0.082
0.700	-0.129	-0.131
0.650	-0.165	-0.168
0.600	-0.201	-0.205
0.550	-0.244	-0.249
0.500	-0.286	-0.291
0.450	-0.330	-0.337
0.400	-0.377	-0.384
0.350	-0.440	-0.449
0.300	-0.499	-0.508
0.250	-0.561	-0.572
0.200	-0.568	-0.578
0.150	-0.504	-0.513
0.100	-0.366	-0.373
0.070	-0.272	-0.278
0.050	-0.154	-0.157
0.030	0.032	0.032
0.011	0.458	0.467

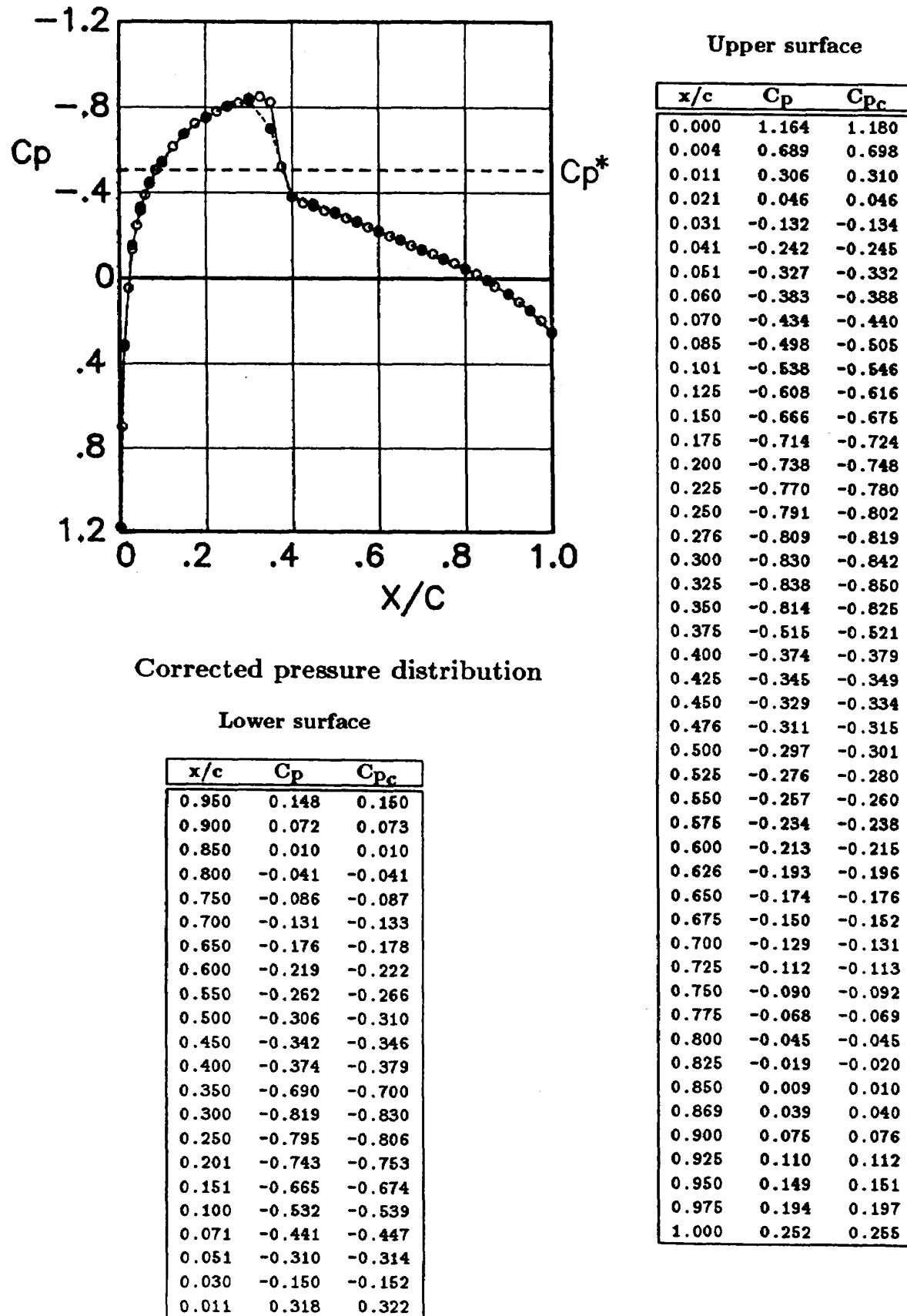
Fig. 45 Pressure distribution ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6913	1	0.822	0.799	0.00	38.3×10^6	-0.013	-0.013	0.0136

Fig. 46 Pressure distribution ($c = 250$ mm).

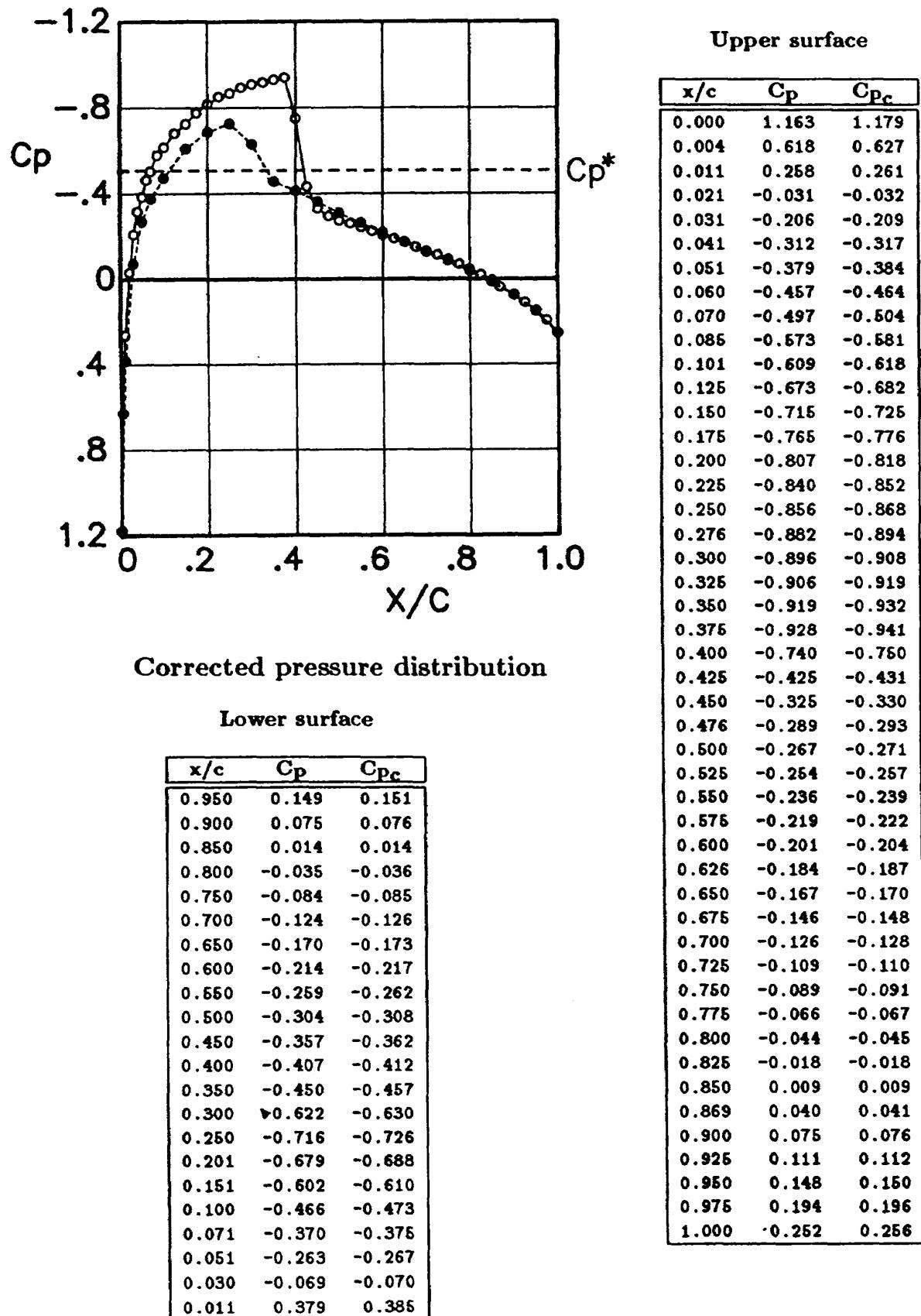
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6946	1	0.793	0.777	0.01	7.1×10^6	0.005	0.005	0.0102

(AR=2.0)

Fig. 47 Pressure distribution ($c = 150$ mm).

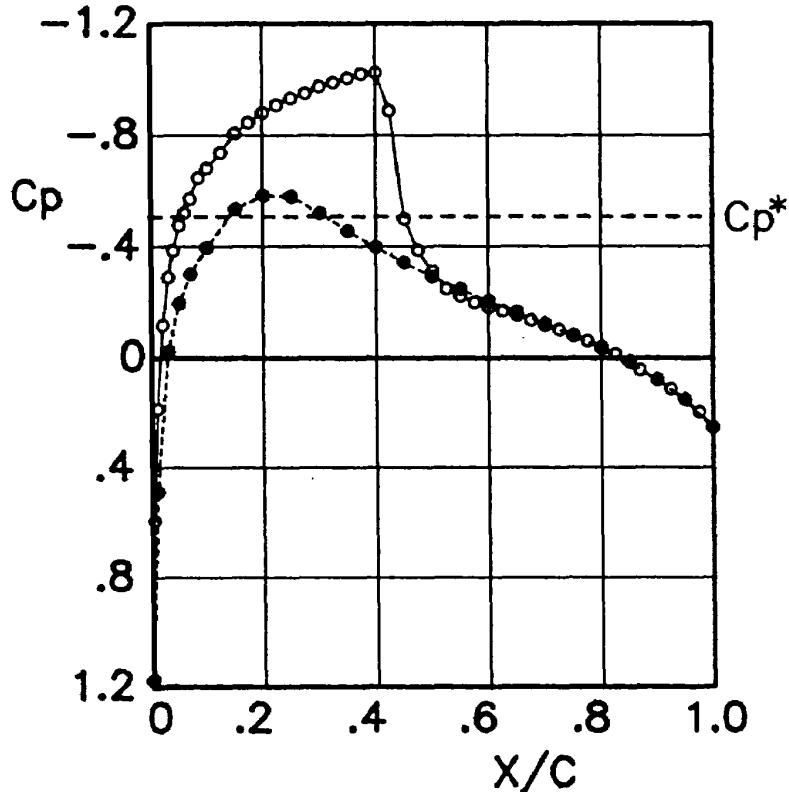
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6946	2	0.792	0.776	0.51	7.1×10^6	0.087	0.088	0.0110

(AR=2.0)

Fig. 48 Pressure distribution ($c = 150$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6946	3	0.792	0.776	1.01	7.1×10^6	0.168	0.171	0.0144

(AR=2.0)



Corrected pressure distribution

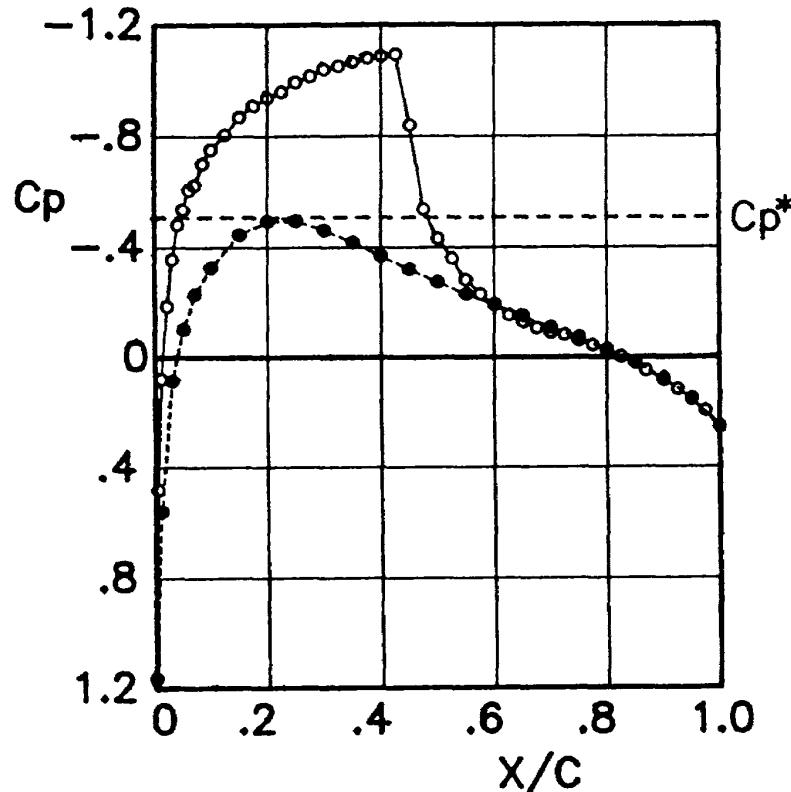
Lower surface

x/c	Cp	C _{Pc}
0.950	0.151	0.153
0.900	0.076	0.077
0.850	0.015	0.015
0.800	-0.033	-0.034
0.750	-0.077	-0.078
0.700	-0.120	-0.121
0.650	-0.161	-0.163
0.600	-0.201	-0.204
0.550	-0.243	-0.247
0.500	-0.288	-0.292
0.450	-0.339	-0.343
0.400	-0.393	-0.399
0.350	-0.450	-0.457
0.300	-0.514	-0.521
0.250	-0.573	-0.581
0.201	-0.577	-0.585
0.151	-0.528	-0.535
0.100	-0.390	-0.396
0.071	-0.296	-0.300
0.051	-0.193	-0.195
0.030	-0.022	-0.022
0.011	0.484	0.491

Fig. 49 Pressure distribution ($c = 150$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6946	4	0.792	0.776	1.51	7.1×10^6	0.249	0.252	0.0185

(AR=2.0)



Upper surface

x/c	Cp	C _{Pc}
0.000	1.148	1.163
0.004	0.473	0.480
0.011	0.076	0.077
0.021	-0.184	-0.187
0.031	-0.353	-0.358
0.041	-0.476	-0.483
0.051	-0.531	-0.539
0.060	-0.600	-0.608
0.070	-0.618	-0.626
0.085	-0.693	-0.703
0.101	-0.743	-0.753
0.125	-0.795	-0.806
0.150	-0.858	-0.870
0.175	-0.899	-0.911
0.200	-0.927	-0.940
0.225	-0.948	-0.961
0.250	-0.982	-0.996
0.276	-1.003	-1.017
0.300	-1.027	-1.041
0.325	-1.038	-1.053
0.350	-1.052	-1.067
0.375	-1.067	-1.082
0.400	-1.073	-1.087
0.425	-1.080	-1.095
0.450	-0.828	-0.840
0.476	-0.530	-0.538
0.500	-0.425	-0.431
0.525	-0.354	-0.359
0.550	-0.278	-0.282
0.575	-0.226	-0.229
0.600	-0.186	-0.188
0.625	-0.150	-0.152
0.650	-0.125	-0.127
0.675	-0.104	-0.105
0.700	-0.088	-0.089
0.725	-0.080	-0.081
0.750	-0.059	-0.060
0.775	-0.042	-0.043
0.800	-0.025	-0.025
0.825	0.000	0.000
0.850	0.022	0.023
0.869	0.051	0.051
0.900	0.084	0.085
0.925	0.117	0.118
0.950	0.152	0.155
0.975	0.194	0.197
1.000	0.250	0.254

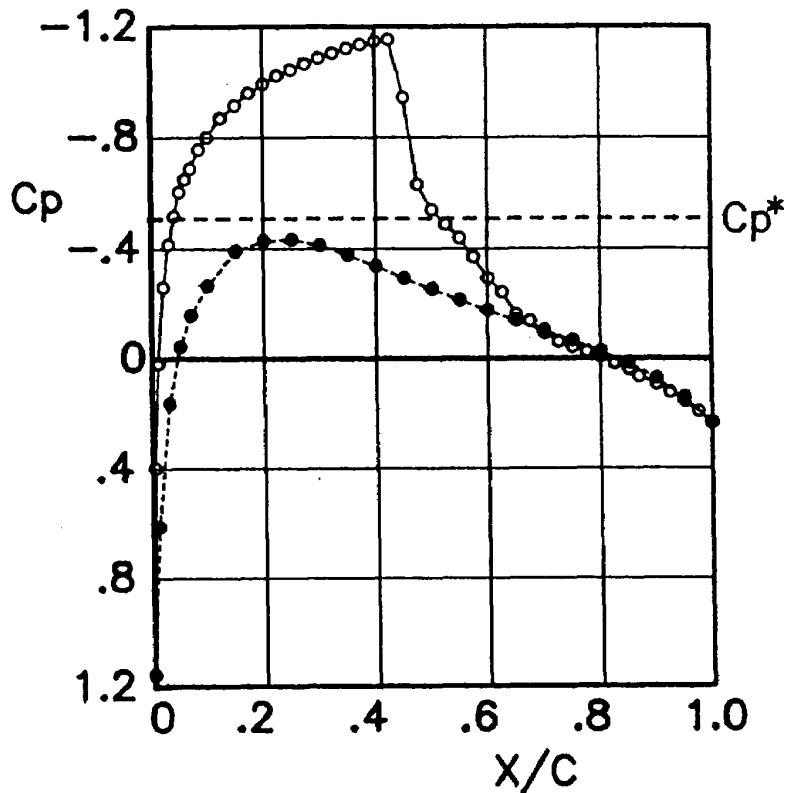
Lower surface

x/c	Cp	C _{Pc}
0.950	0.149	0.151
0.900	0.077	0.078
0.850	0.018	0.019
0.800	-0.029	-0.029
0.750	-0.071	-0.072
0.700	-0.108	-0.109
0.650	-0.150	-0.152
0.600	-0.191	-0.194
0.550	-0.227	-0.230
0.500	-0.271	-0.275
0.450	-0.317	-0.322
0.400	-0.364	-0.369
0.350	-0.413	-0.419
0.300	-0.456	-0.463
0.250	-0.489	-0.496
0.201	-0.488	-0.495
0.151	-0.440	-0.446
0.100	-0.323	-0.328
0.071	-0.227	-0.230
0.051	-0.101	-0.103
0.030	0.085	0.086
0.011	0.551	0.558

Fig. 50. Pressure distribution ($c = 150$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6946	5	0.792	0.776	2.01	7.1×10^6	0.320	0.324	0.0248

(AR=2.0)



Upper surface

x/c	C_p	C_{p_c}
0.000	1.139	1.154
0.004	0.391	0.397
0.011	0.017	0.017
0.021	-0.259	-0.262
0.031	-0.411	-0.417
0.041	-0.511	-0.518
0.051	-0.596	-0.604
0.060	-0.641	-0.650
0.070	-0.679	-0.688
0.085	-0.746	-0.757
0.101	-0.790	-0.801
0.125	-0.858	-0.870
0.150	-0.904	-0.916
0.175	-0.947	-0.960
0.200	-0.979	-0.993
0.225	-1.009	-1.023
0.250	-1.030	-1.044
0.276	-1.051	-1.066
0.300	-1.072	-1.087
0.325	-1.090	-1.105
0.350	-1.106	-1.122
0.375	-1.121	-1.136
0.400	-1.132	-1.148
0.425	-1.138	-1.154
0.450	-0.931	-0.944
0.476	-0.622	-0.630
0.500	-0.532	-0.539
0.525	-0.481	-0.487
0.550	-0.431	-0.437
0.575	-0.364	-0.369
0.600	-0.288	-0.292
0.626	-0.238	-0.242
0.650	-0.158	-0.160
0.675	-0.134	-0.136
0.700	-0.091	-0.092
0.725	-0.060	-0.061
0.750	-0.040	-0.041
0.775	-0.022	-0.023
0.800	-0.005	-0.005
0.825	0.019	0.019
0.850	0.041	0.042
0.869	0.067	0.068
0.900	0.095	0.097
0.925	0.124	0.126
0.950	0.166	0.158
0.975	0.193	0.196
1.000	0.234	0.237

Corrected pressure distribution

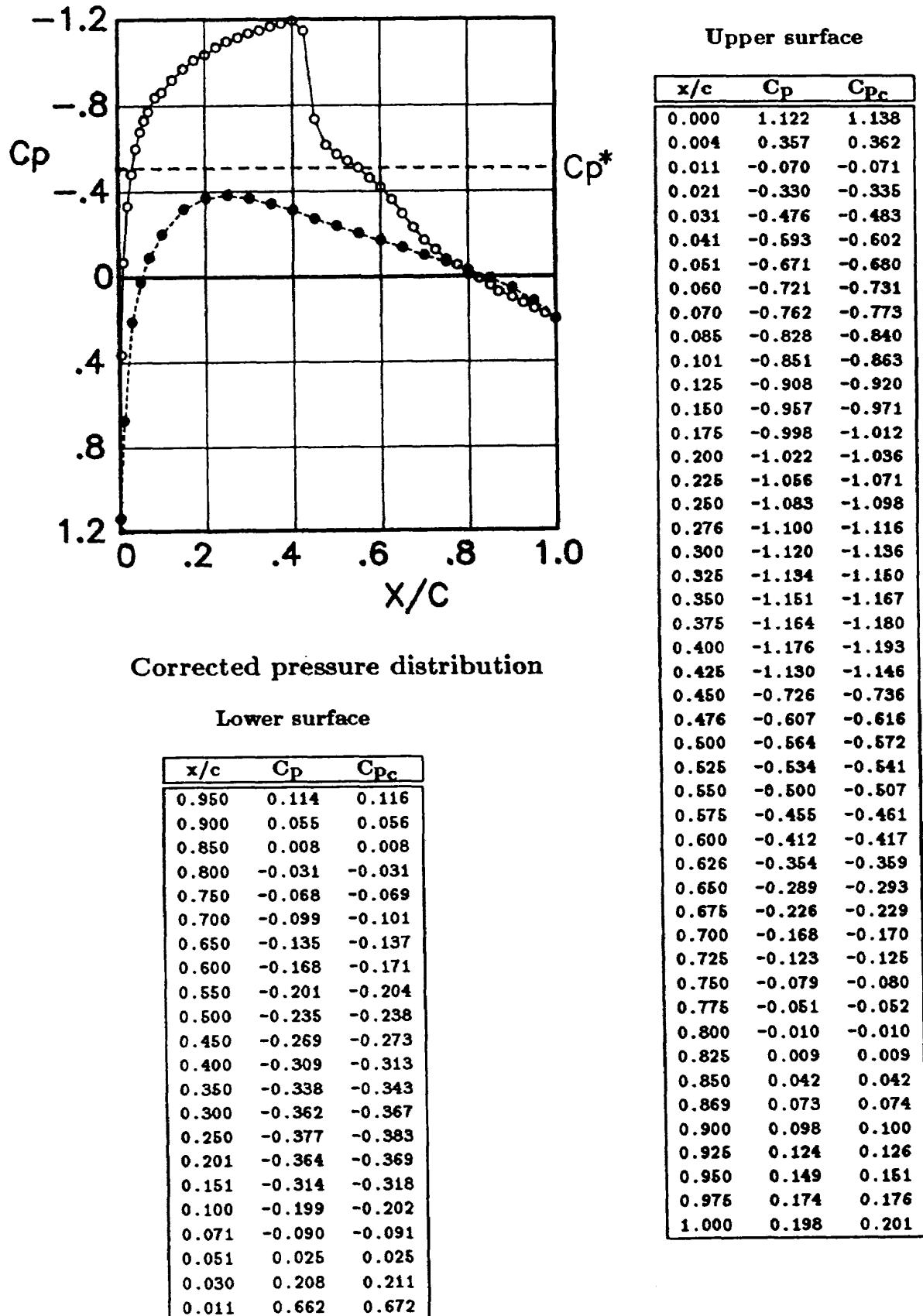
Lower surface

x/c	C_p	C_{p_c}
0.950	0.141	0.143
0.900	0.072	0.073
0.850	0.017	0.017
0.800	-0.025	-0.026
0.750	-0.066	-0.067
0.700	-0.103	-0.104
0.650	-0.138	-0.140
0.600	-0.175	-0.177
0.550	-0.211	-0.214
0.500	-0.251	-0.255
0.450	-0.290	-0.294
0.400	-0.334	-0.339
0.350	-0.373	-0.378
0.300	-0.408	-0.413
0.250	-0.428	-0.434
0.201	-0.422	-0.428
0.151	-0.386	-0.392
0.100	-0.263	-0.267
0.071	-0.157	-0.159
0.051	-0.043	-0.043
0.030	0.162	0.165
0.011	0.603	0.612

Fig. 51 Pressure distribution ($c = 150$ mm).

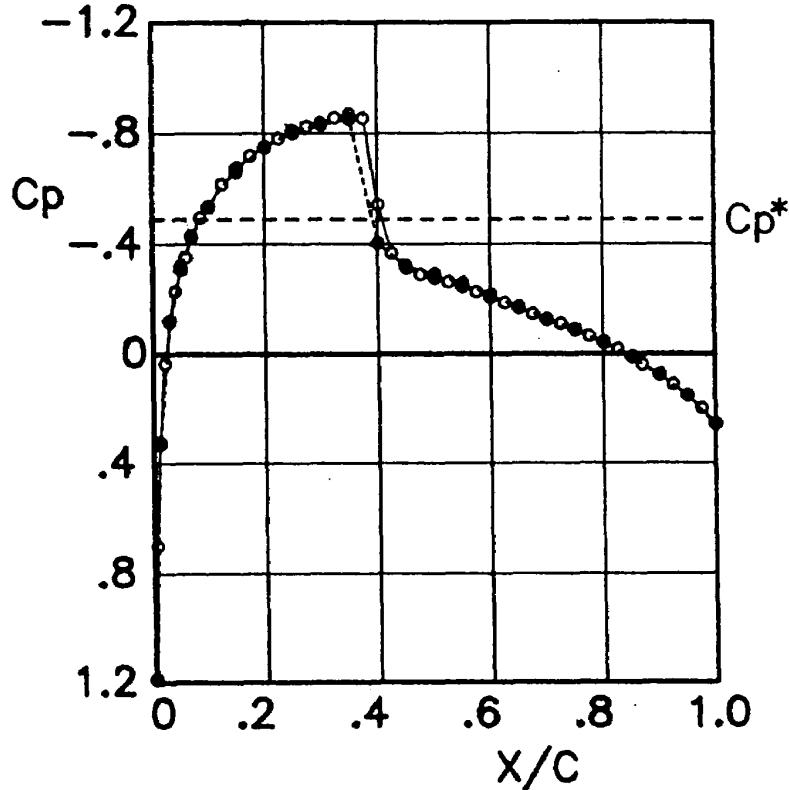
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6946	6	0.792	0.776	2.51	7.2×10^6	0.381	0.386	0.0327

(AR=2.0)

Fig. 52 Pressure distribution ($c = 150$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6952	1	0.799	0.782	0.01	7.0×10^6	0.009	0.010	0.0109

(AR=2.0)



Corrected pressure distribution

Upper surface

x/c	C _p	C _{Pc}
0.000	1.171	1.188
0.004	0.688	0.698
0.011	0.317	0.321
0.021	0.036	0.036
0.031	-0.117	-0.118
0.041	-0.227	-0.230
0.051	-0.318	-0.323
0.060	-0.348	-0.353
0.070	-0.425	-0.431
0.085	-0.488	-0.495
0.101	-0.524	-0.532
0.125	-0.607	-0.616
0.150	-0.651	-0.661
0.175	-0.708	-0.719
0.200	-0.742	-0.752
0.225	-0.769	-0.781
0.250	-0.788	-0.800
0.276	-0.814	-0.826
0.300	-0.826	-0.838
0.325	-0.843	-0.856
0.350	-0.857	-0.869
0.375	-0.842	-0.854
0.400	-0.535	-0.543
0.425	-0.361	-0.367
0.450	-0.309	-0.313
0.476	-0.286	-0.290
0.500	-0.272	-0.276
0.525	-0.269	-0.262
0.550	-0.241	-0.244
0.575	-0.223	-0.226
0.600	-0.202	-0.205
0.626	-0.184	-0.187
0.650	-0.164	-0.166
0.675	-0.144	-0.146
0.700	-0.122	-0.123
0.725	-0.109	-0.110
0.750	-0.088	-0.089
0.775	-0.063	-0.064
0.800	-0.042	-0.043
0.825	-0.014	-0.014
0.850	0.013	0.013
0.869	0.042	0.042
0.900	0.078	0.080
0.925	0.112	0.114
0.950	0.153	0.155
0.975	0.200	0.202
1.000	0.257	0.261

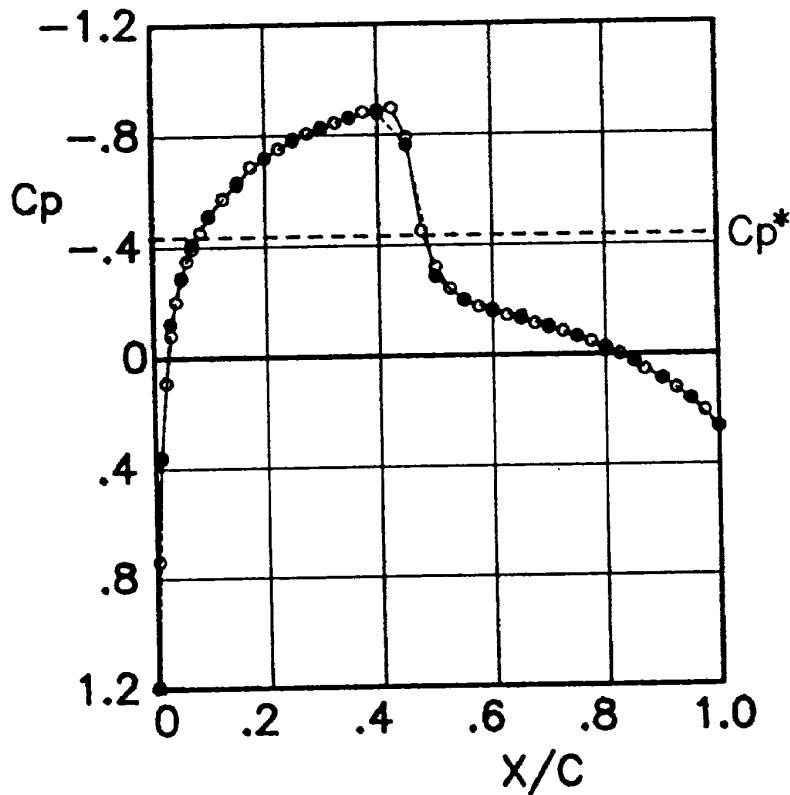
Lower surface

x/c	C _p	C _{Pc}
0.950	0.152	0.154
0.900	0.076	0.077
0.850	0.014	0.014
0.800	-0.037	-0.037
0.750	-0.085	-0.086
0.700	-0.127	-0.128
0.650	-0.171	-0.173
0.600	-0.213	-0.216
0.550	-0.253	-0.257
0.500	-0.287	-0.291
0.450	-0.318	-0.322
0.400	-0.398	-0.404
0.350	-0.840	-0.852
0.300	-0.819	-0.831
0.250	-0.799	-0.810
0.201	-0.737	-0.748
0.151	-0.666	-0.676
0.100	-0.528	-0.535
0.071	-0.418	-0.424
0.051	-0.303	-0.308
0.030	-0.120	-0.122
0.011	0.328	0.333

Fig. 53 Pressure distribution ($c = 150$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6945	1	0.817	0.800	0.01	7.1×10^6	0.001	0.001	0.0159

(AR=2.0)



Upper surface

x/c	Cp	Cpc
0.000	1.177	1.193
0.004	0.727	0.737
0.011	0.359	0.364
0.021	0.089	0.090
0.031	-0.079	-0.081
0.041	-0.201	-0.203
0.051	-0.284	-0.288
0.060	-0.347	-0.351
0.070	-0.389	-0.395
0.085	-0.447	-0.453
0.101	-0.503	-0.510
0.125	-0.567	-0.575
0.150	-0.615	-0.623
0.175	-0.679	-0.689
0.200	-0.711	-0.721
0.225	-0.743	-0.753
0.250	-0.770	-0.780
0.276	-0.796	-0.807
0.300	-0.818	-0.830
0.325	-0.834	-0.845
0.350	-0.851	-0.863
0.375	-0.871	-0.884
0.400	-0.878	-0.890
0.425	-0.885	-0.897
0.450	-0.780	-0.791
0.476	-0.446	-0.452
0.500	-0.318	-0.322
0.525	-0.239	-0.242
0.550	-0.199	-0.202
0.575	-0.173	-0.175
0.600	-0.154	-0.156
0.626	-0.141	-0.143
0.650	-0.127	-0.128
0.675	-0.110	-0.112
0.700	-0.094	-0.096
0.725	-0.082	-0.083
0.750	-0.063	-0.064
0.775	-0.044	-0.045
0.800	-0.024	-0.024
0.825	0.002	0.002
0.850	0.026	0.026
0.869	0.056	0.057
0.900	0.090	0.092
0.925	0.123	0.125
0.950	0.161	0.164
0.975	0.205	0.208
1.000	0.262	0.266

Corrected pressure distribution

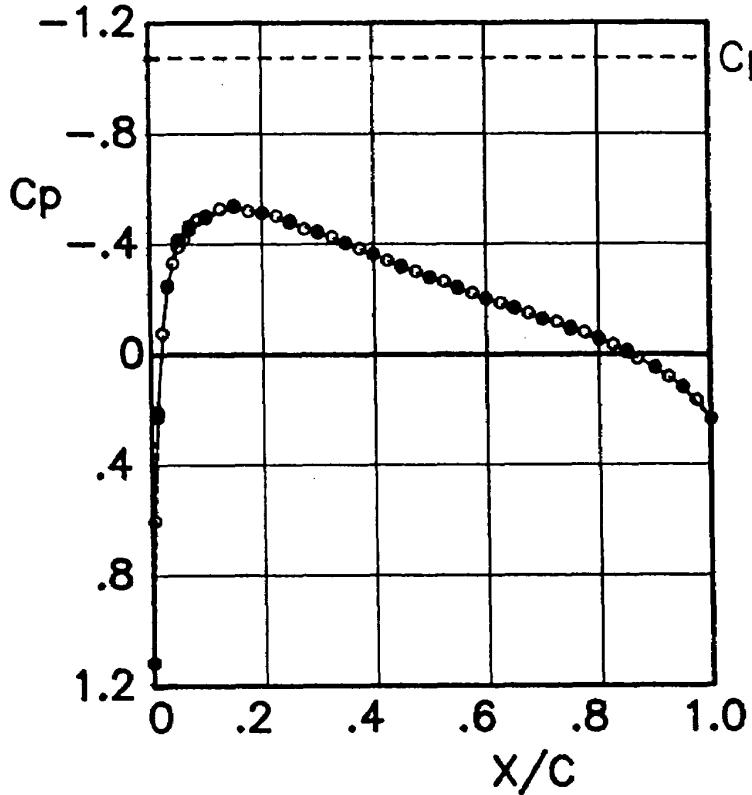
Lower surface

x/c	Cp	Cpc
0.950	0.161	0.163
0.900	0.087	0.089
0.850	0.027	0.027
0.800	-0.021	-0.021
0.750	-0.063	-0.064
0.700	-0.101	-0.102
0.650	-0.135	-0.137
0.600	-0.164	-0.166
0.550	-0.196	-0.199
0.500	-0.284	-0.288
0.450	-0.752	-0.763
0.400	-0.867	-0.879
0.350	-0.851	-0.862
0.300	-0.812	-0.823
0.250	-0.776	-0.786
0.201	-0.709	-0.719
0.151	-0.624	-0.633
0.100	-0.507	-0.514
0.071	-0.406	-0.411
0.051	-0.286	-0.290
0.030	-0.119	-0.121
0.011	0.354	0.359

Fig. 54 Pressure distribution ($c = 150$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6950	1	0.649	0.638	0.01	20.8×10^6	0.002	0.003	0.0068

(AR=2.0)



Corrected pressure distribution

Lower surface

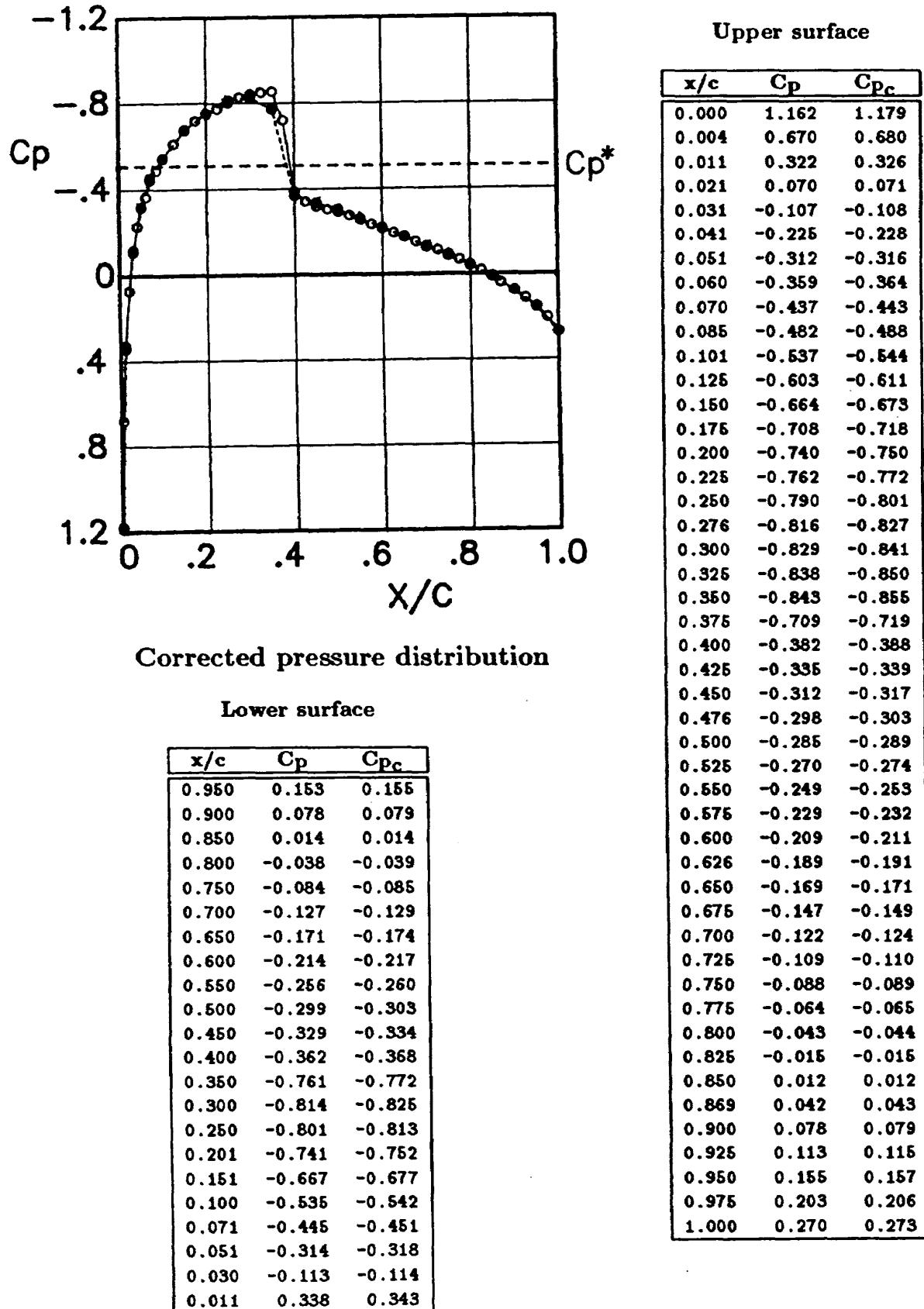
x/c	C _p	C _{p_c}
0.950	0.119	0.120
0.900	0.048	0.049
0.850	-0.007	-0.007
0.800	-0.052	-0.052
0.750	-0.089	-0.090
0.700	-0.126	-0.128
0.650	-0.165	-0.166
0.600	-0.198	-0.200
0.550	-0.236	-0.239
0.500	-0.276	-0.279
0.450	-0.314	-0.318
0.400	-0.358	-0.363
0.350	-0.400	-0.405
0.300	-0.437	-0.442
0.250	-0.480	-0.486
0.201	-0.508	-0.514
0.151	-0.529	-0.535
0.100	-0.489	-0.495
0.071	-0.460	-0.465
0.051	-0.410	-0.415
0.030	-0.248	-0.250
0.011	0.208	0.210

x/c	C _p	C _{p_c}
0.000	1.103	1.116
0.004	0.595	0.602
0.011	0.225	0.228
0.021	-0.075	-0.076
0.031	-0.243	-0.245
0.041	-0.328	-0.332
0.051	-0.385	-0.390
0.060	-0.412	-0.417
0.070	-0.446	-0.452
0.085	-0.483	-0.489
0.101	-0.497	-0.503
0.125	-0.522	-0.528
0.150	-0.535	-0.542
0.175	-0.513	-0.520
0.200	-0.508	-0.514
0.225	-0.496	-0.502
0.250	-0.471	-0.477
0.276	-0.450	-0.455
0.300	-0.441	-0.447
0.325	-0.422	-0.427
0.350	-0.398	-0.403
0.375	-0.379	-0.384
0.400	-0.359	-0.364
0.425	-0.337	-0.341
0.450	-0.318	-0.322
0.476	-0.297	-0.301
0.500	-0.277	-0.281
0.525	-0.261	-0.264
0.550	-0.240	-0.243
0.575	-0.219	-0.222
0.600	-0.201	-0.203
0.626	-0.184	-0.186
0.650	-0.167	-0.169
0.675	-0.147	-0.149
0.700	-0.125	-0.127
0.725	-0.116	-0.118
0.750	-0.096	-0.097
0.775	-0.077	-0.078
0.800	-0.059	-0.059
0.825	-0.033	-0.034
0.850	-0.012	-0.012
0.869	0.016	0.016
0.900	0.050	0.051
0.925	0.082	0.083
0.950	0.119	0.121
0.975	0.167	0.169
1.000	0.234	0.237

Fig. 55 Pressure distribution ($c = 150$ mm).

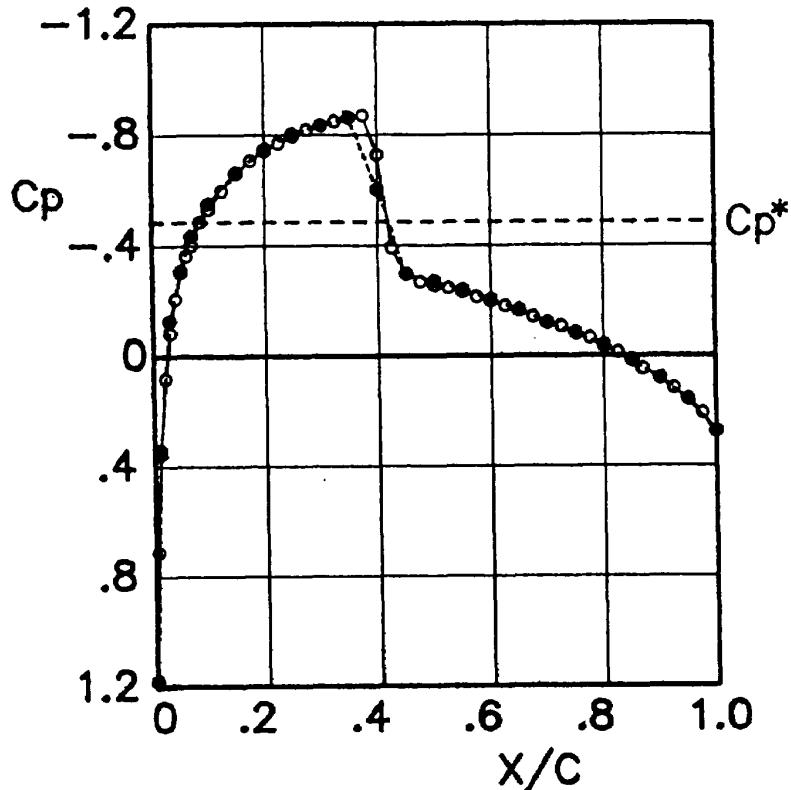
Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6949	1	0.792	0.776	0.01	20.9×10^6	0.007	0.007	0.0094

(AR=2.0)

Fig. 56 Pressure distribution ($c = 150$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{lu}	C_{lc}	$C_{d_{wake}}$
6947	1	0.801	0.784	0.00	21.0×10^6	0.002	0.002	0.0109

(AR=2.0)



Corrected pressure distribution

Upper surface

x/c	Cp	Cpc
0.000	1.164	1.180
0.004	0.701	0.711
0.011	0.333	0.338
0.021	0.079	0.080
0.031	-0.083	-0.084
0.041	-0.205	-0.208
0.051	-0.300	-0.305
0.060	-0.358	-0.363
0.070	-0.396	-0.402
0.085	-0.480	-0.486
0.101	-0.523	-0.531
0.125	-0.589	-0.597
0.150	-0.651	-0.660
0.175	-0.696	-0.706
0.200	-0.730	-0.741
0.225	-0.758	-0.769
0.250	-0.783	-0.794
0.276	-0.808	-0.820
0.300	-0.822	-0.834
0.325	-0.836	-0.848
0.350	-0.851	-0.863
0.375	-0.868	-0.870
0.400	-0.716	-0.727
0.425	-0.384	-0.390
0.450	-0.294	-0.298
0.476	-0.264	-0.268
0.500	-0.260	-0.263
0.525	-0.242	-0.246
0.550	-0.228	-0.231
0.575	-0.209	-0.212
0.600	-0.193	-0.196
0.626	-0.177	-0.180
0.650	-0.159	-0.161
0.675	-0.138	-0.140
0.700	-0.115	-0.116
0.725	-0.103	-0.104
0.750	-0.081	-0.083
0.775	-0.061	-0.062
0.800	-0.039	-0.039
0.825	-0.011	-0.011
0.850	0.015	0.015
0.869	0.047	0.048
0.900	0.081	0.082
0.925	0.116	0.118
0.950	0.157	0.159
0.975	0.206	0.209
1.000	0.273	0.276

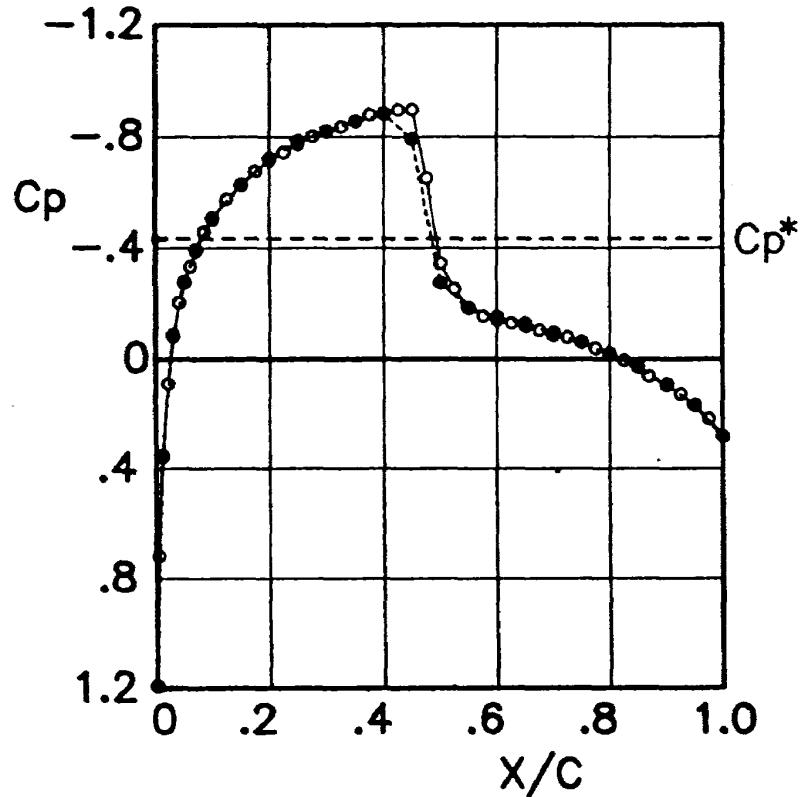
Lower surface

x/c	Cp	Cpc
0.950	0.156	0.158
0.900	0.080	0.081
0.850	0.018	0.018
0.800	-0.033	-0.033
0.750	-0.078	-0.079
0.700	-0.119	-0.121
0.650	-0.164	-0.166
0.600	-0.202	-0.205
0.550	-0.237	-0.240
0.500	-0.268	-0.271
0.450	-0.293	-0.297
0.400	-0.594	-0.602
0.350	-0.849	-0.861
0.300	-0.823	-0.835
0.250	-0.793	-0.804
0.201	-0.737	-0.747
0.151	-0.655	-0.664
0.100	-0.544	-0.551
0.071	-0.428	-0.434
0.051	-0.306	-0.310
0.030	-0.125	-0.127
0.011	0.351	0.356

Fig. 57 Pressure distribution ($c = 150$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6948	1	0.818	0.801	0.00	20.9×10^6	0.009	0.009	0.0160

(AR=2.0)

**Corrected pressure distribution****Lower surface**

x/c	Cp	C _{p_c}
0.950	0.166	0.168
0.900	0.091	0.092
0.850	0.031	0.031
0.800	-0.015	-0.015
0.750	-0.059	-0.060
0.700	-0.094	-0.095
0.650	-0.126	-0.127
0.600	-0.149	-0.151
0.550	-0.181	-0.184
0.500	-0.271	-0.275
0.450	-0.782	-0.793
0.400	-0.869	-0.881
0.350	-0.843	-0.855
0.300	-0.808	-0.819
0.250	-0.775	-0.786
0.201	-0.712	-0.722
0.151	-0.616	-0.625
0.100	-0.502	-0.509
0.071	-0.389	-0.394
0.051	-0.271	-0.274
0.030	-0.086	-0.087
0.011	0.348	0.353

x/c	Cp	C _{p_c}
0.000	1.174	1.191
0.004	0.708	0.718
0.011	0.353	0.358
0.021	0.087	0.088
0.031	-0.081	-0.082
0.041	-0.201	-0.204
0.051	-0.276	-0.280
0.060	-0.329	-0.334
0.070	-0.383	-0.388
0.085	-0.452	-0.459
0.101	-0.495	-0.502
0.125	-0.569	-0.577
0.150	-0.621	-0.630
0.175	-0.667	-0.676
0.200	-0.707	-0.716
0.225	-0.734	-0.744
0.250	-0.763	-0.774
0.276	-0.791	-0.802
0.300	-0.809	-0.821
0.325	-0.824	-0.836
0.350	-0.844	-0.856
0.375	-0.867	-0.879
0.400	-0.873	-0.885
0.425	-0.884	-0.897
0.450	-0.885	-0.898
0.476	-0.644	-0.653
0.500	-0.339	-0.344
0.525	-0.249	-0.253
0.550	-0.181	-0.184
0.575	-0.151	-0.153
0.600	-0.136	-0.138
0.626	-0.126	-0.128
0.650	-0.114	-0.116
0.675	-0.102	-0.103
0.700	-0.083	-0.084
0.725	-0.076	-0.077
0.750	-0.060	-0.061
0.775	-0.037	-0.037
0.800	-0.020	-0.020
0.825	0.006	0.006
0.850	0.031	0.031
0.869	0.063	0.064
0.900	0.095	0.096
0.925	0.127	0.129
0.950	0.167	0.169
0.975	0.215	0.218
1.000	0.279	0.283

Fig. 58 Pressure distribution ($c = 150$ mm).

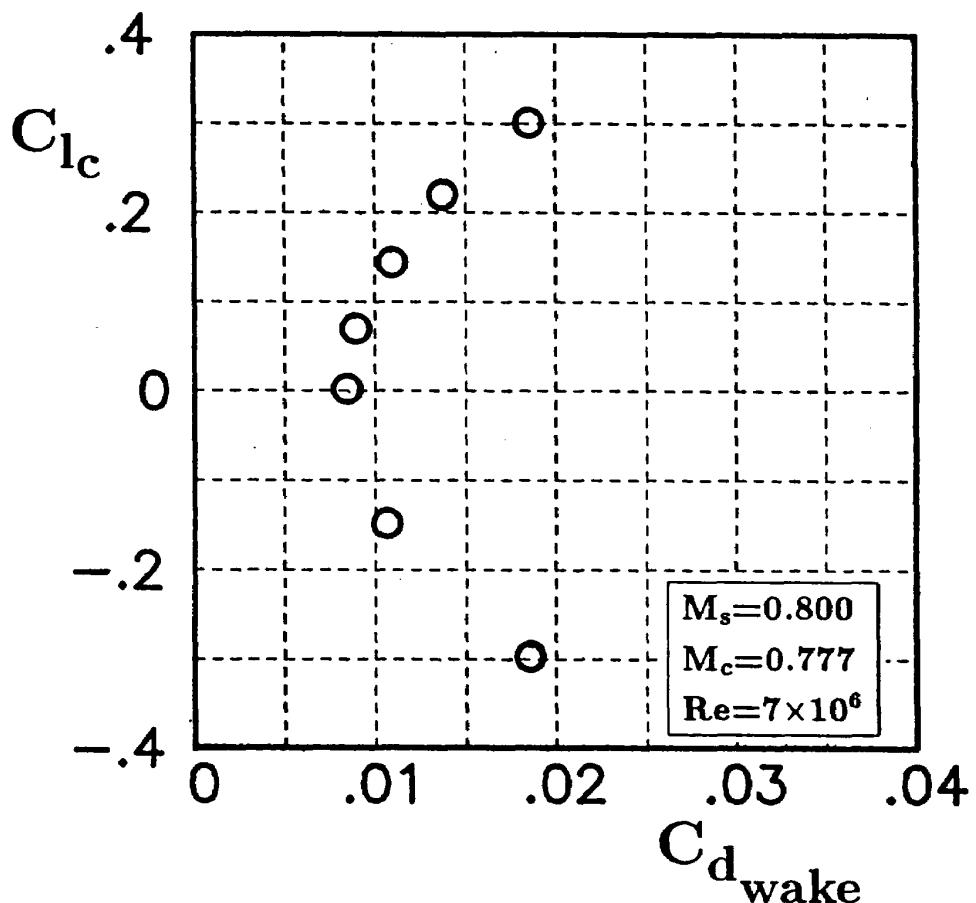


Fig. 59 Drag polar curve ($M_s = 0.800$, $M_c = 0.777$, $Re = 7 \times 10^6$, $c = 250$ mm).

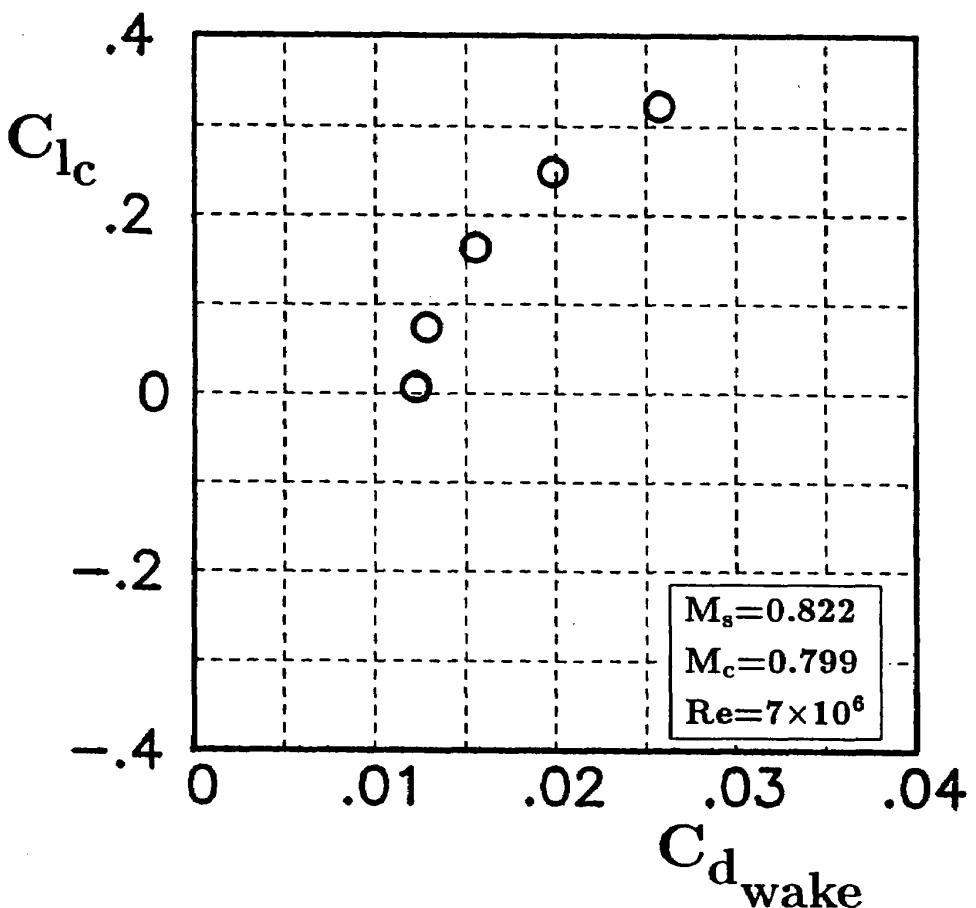


Fig. 60 Drag polar curve ($M_s = 0.822$, $M_c = 0.799$, $Re = 7 \times 10^6$, $c = 250$ mm).

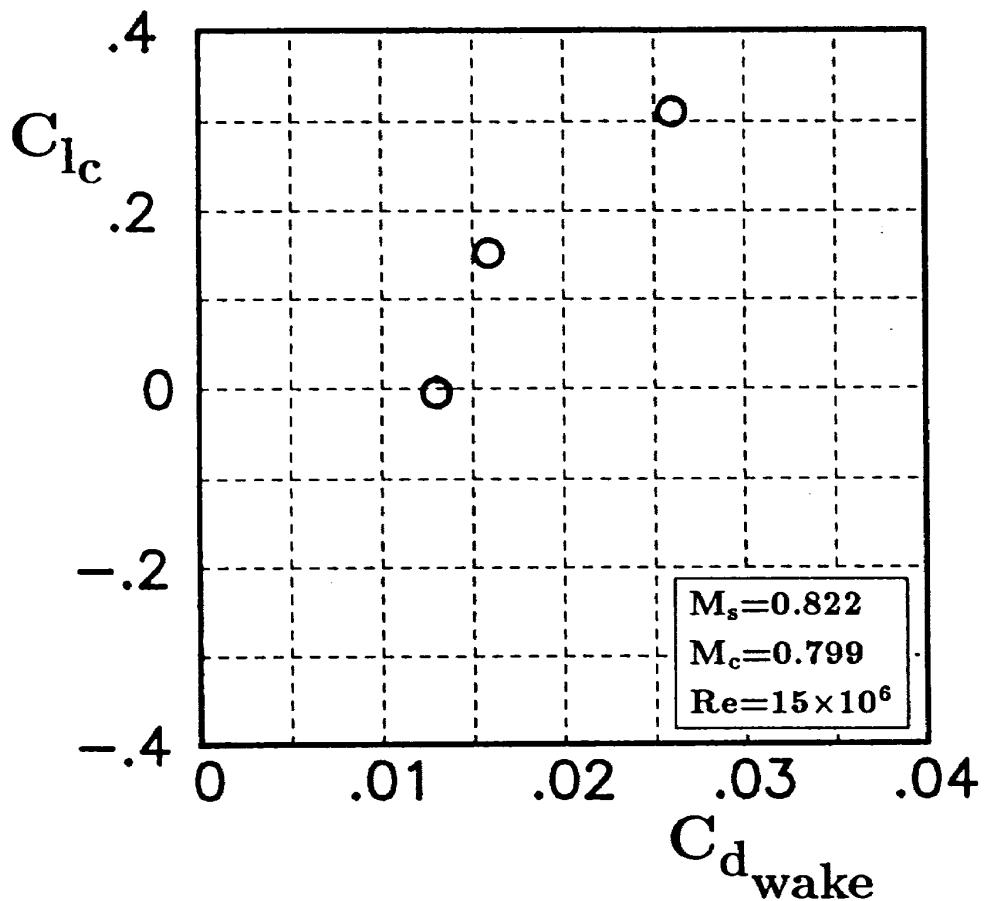


Fig. 61 Drag polar curve ($M_s = 0.822, M_c = 0.799, Re = 15 \times 10^6, c = 250 \text{ mm}$).

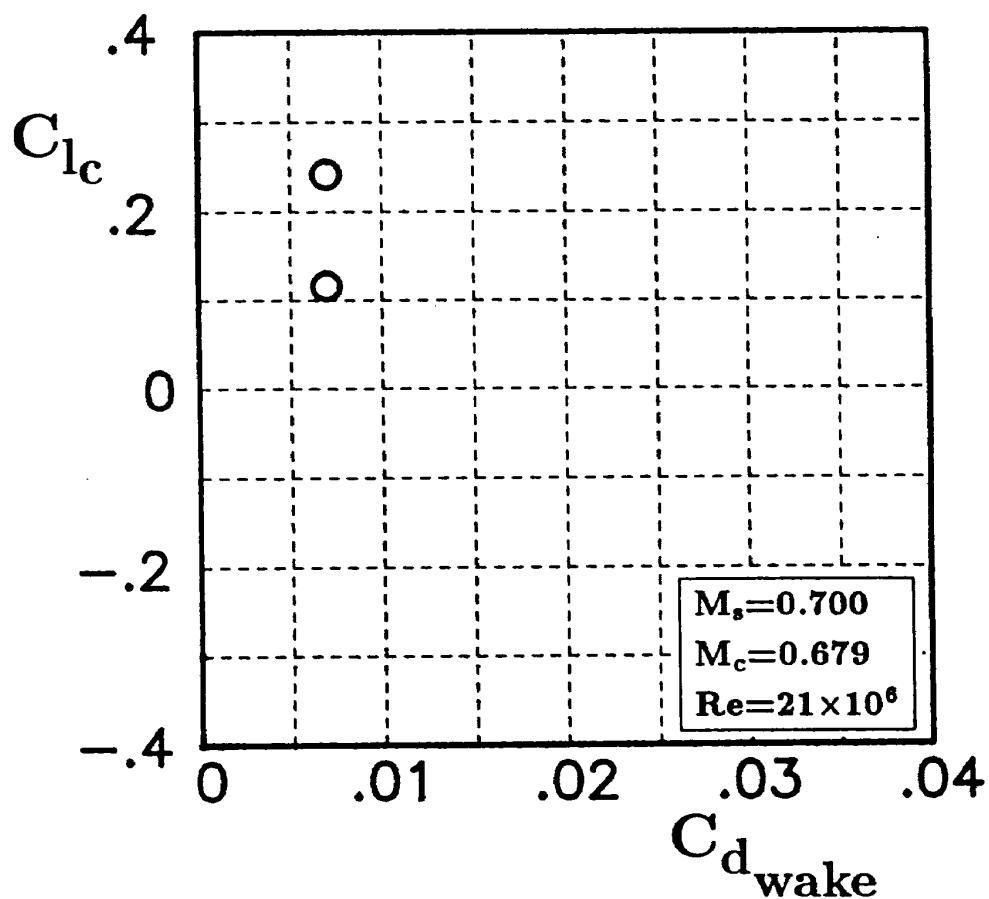


Fig. 62 Drag polar curve ($M_s = 0.700, M_c = 0.679, Re = 21 \times 10^6, c = 250 \text{ mm}$).

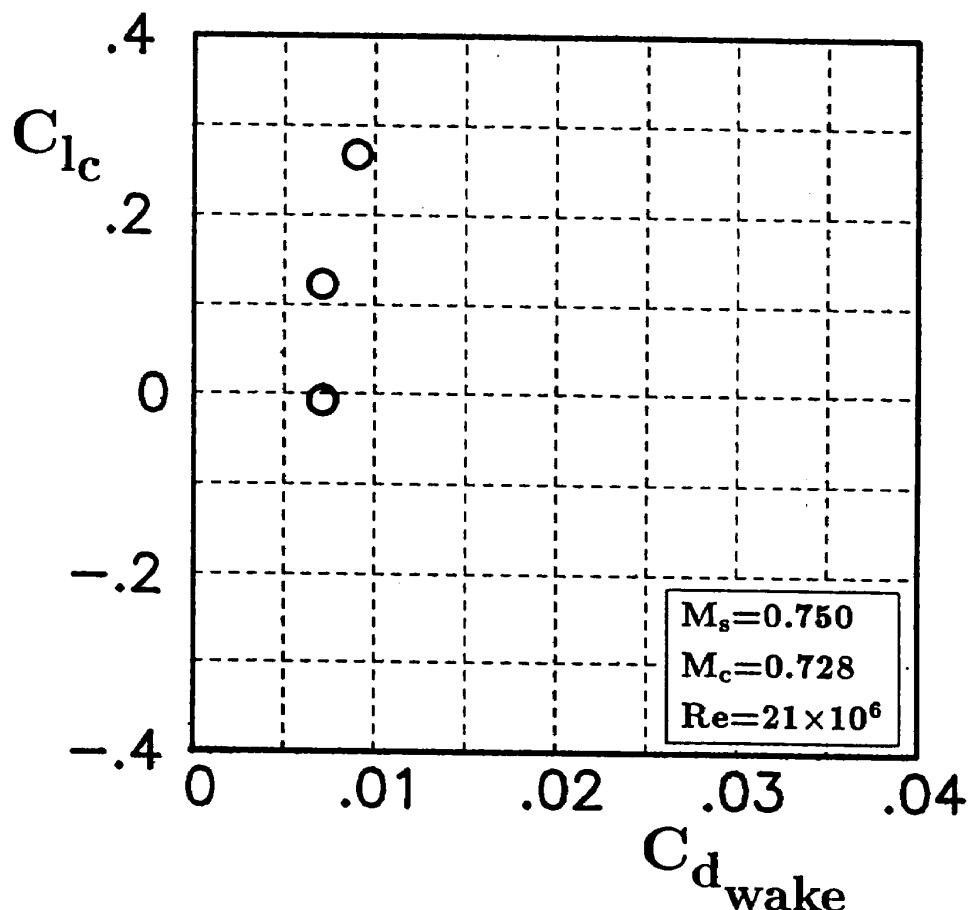


Fig. 63 Drag polar curve ($M_s = 0.750, M_c = 0.728, Re = 21 \times 10^6, c = 250 \text{ mm}$).

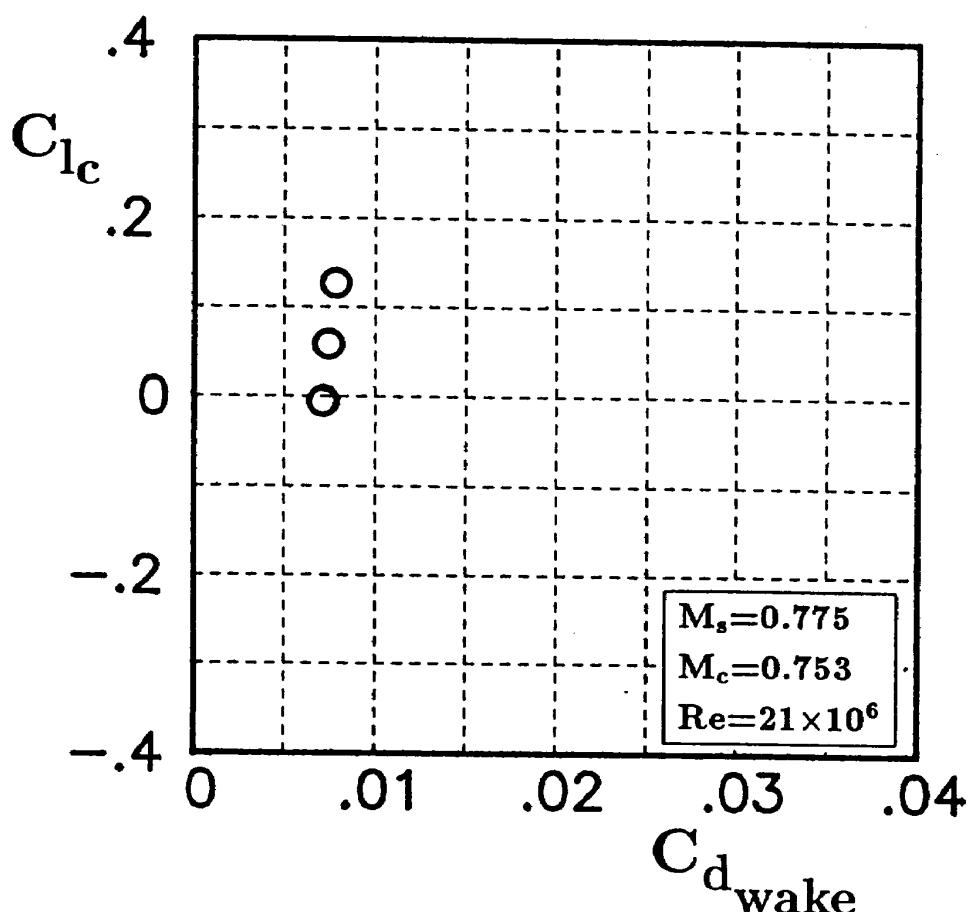


Fig. 64 Drag polar curve ($M_s = 0.775, M_c = 0.753, Re = 21 \times 10^6, c = 250 \text{ mm}$).

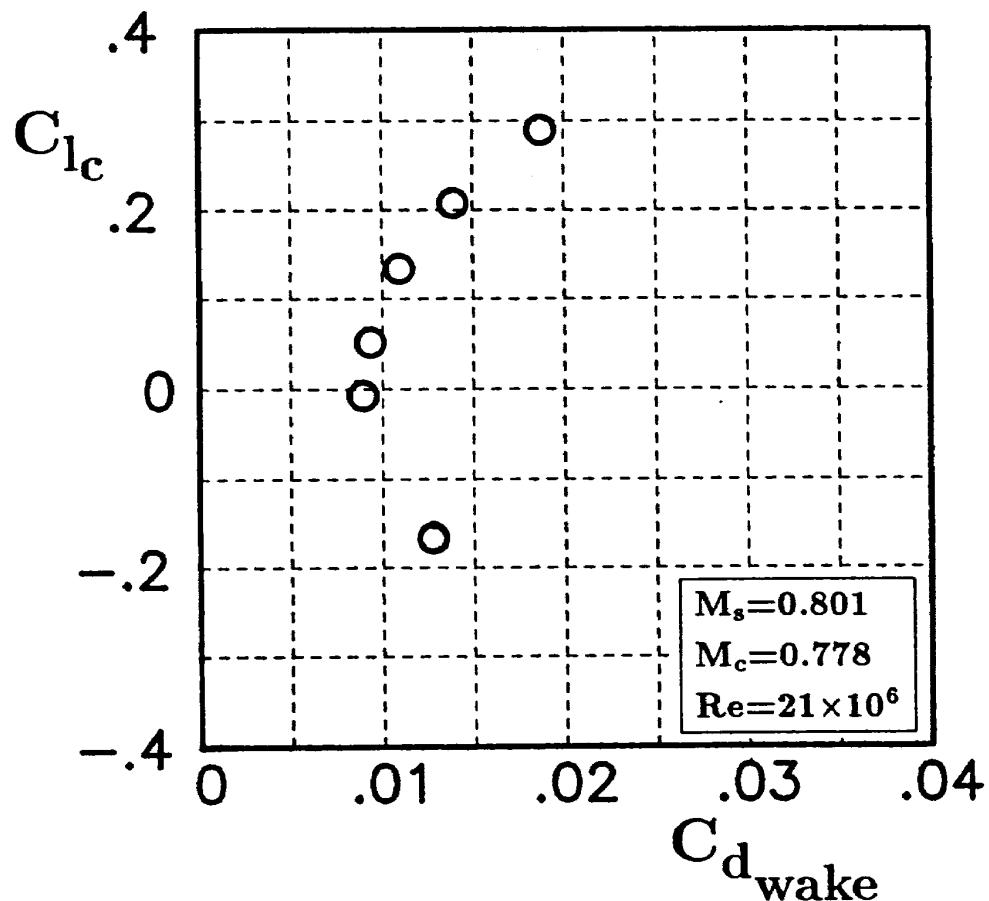


Fig. 65 Drag polar curve ($M_s = 0.801$, $M_c = 0.778$, $Re = 21 \times 10^6$, $c = 250$ mm).

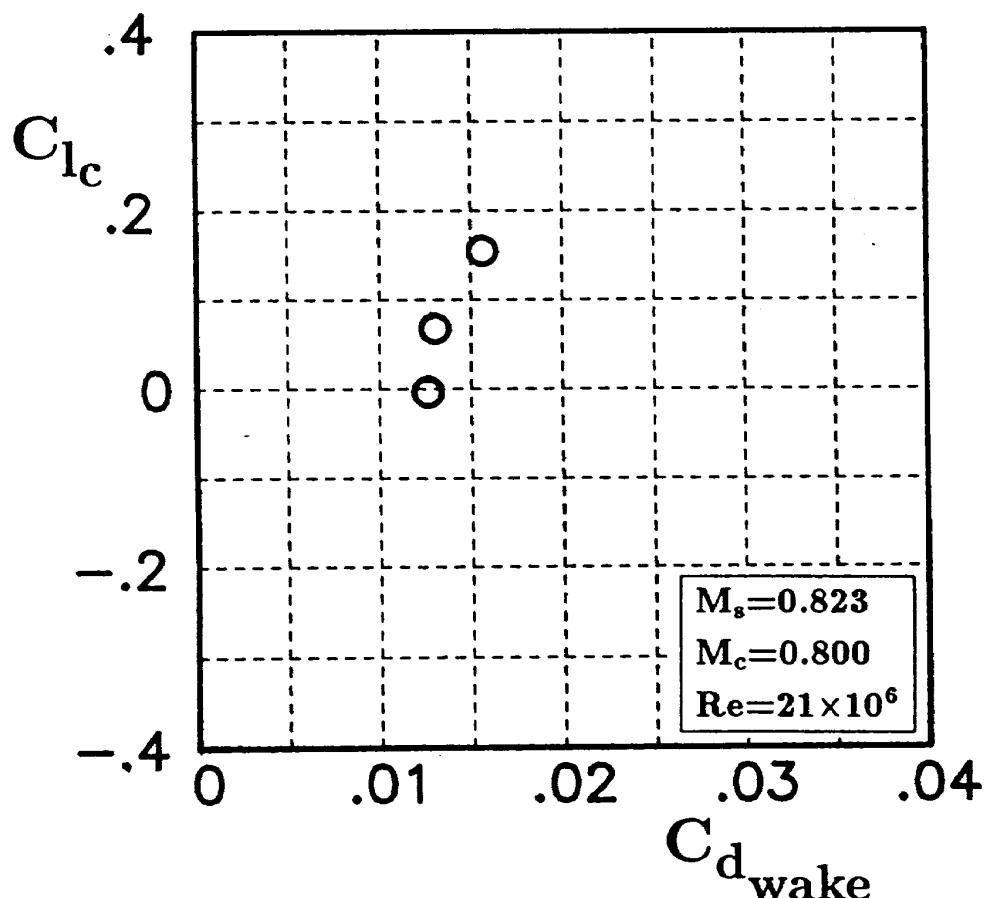


Fig. 66 Drag polar curve ($M_s = 0.823$, $M_c = 0.800$, $Re = 21 \times 10^6$, $c = 250$ mm).

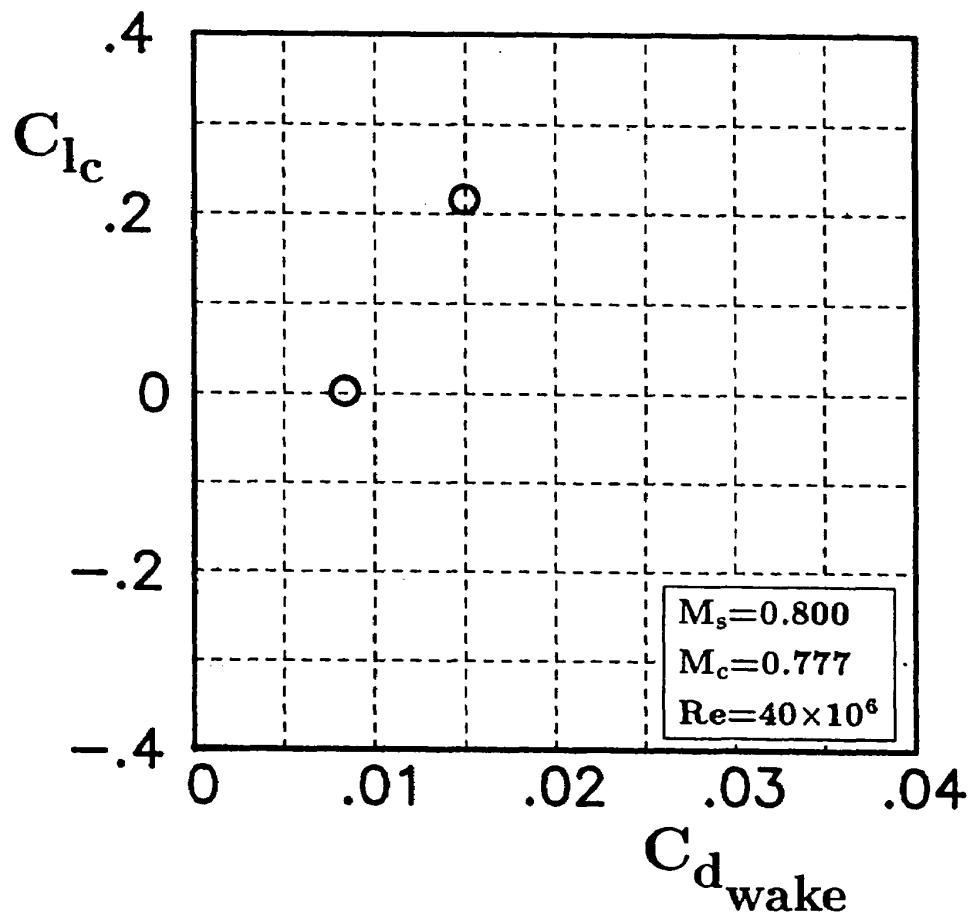


Fig. 67 Drag polar curve ($M_s = 0.800$, $M_c = 0.777$, $Re = 40 \times 10^6$, $c = 250$ mm).

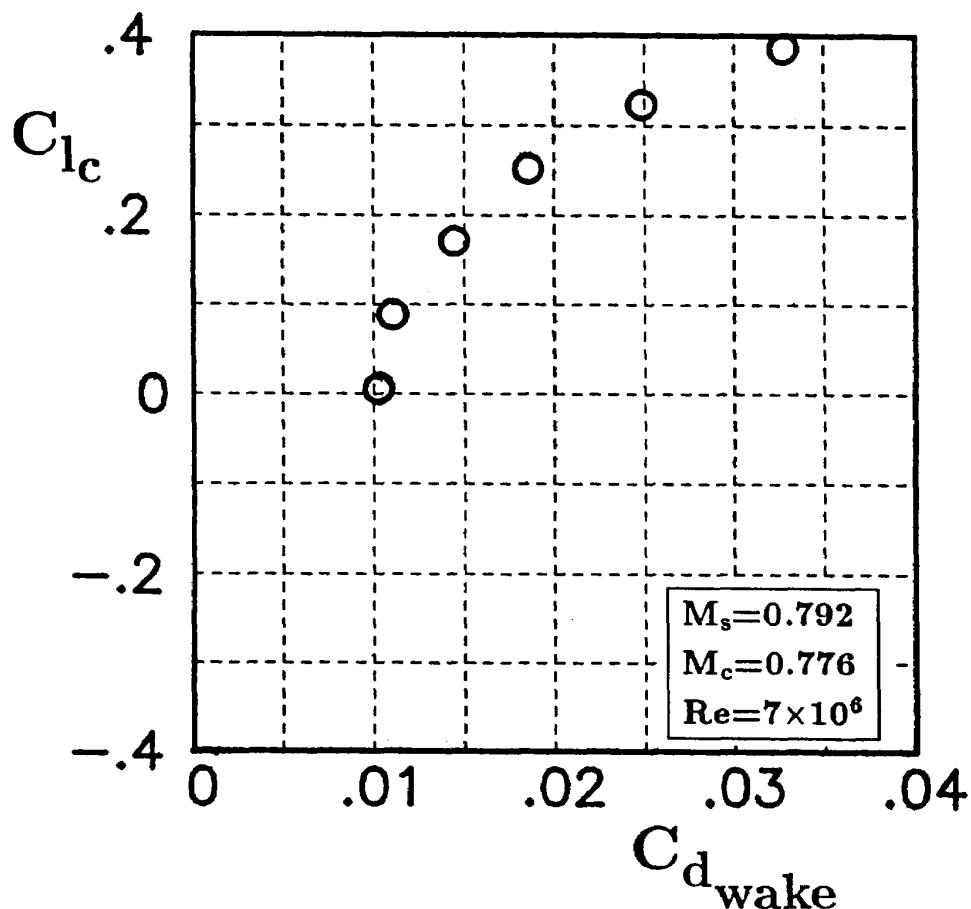
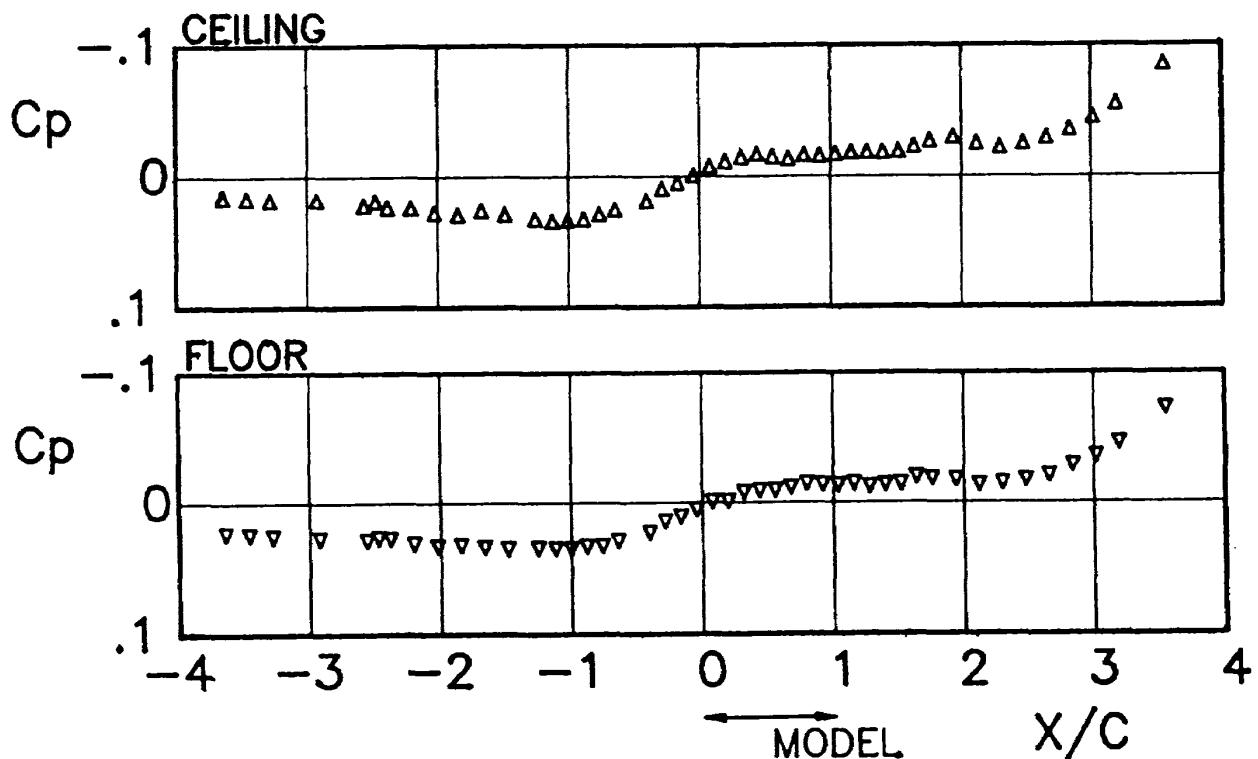


Fig. 68 Drag polar curve ($M_s = 0.792$, $M_c = 0.776$, $Re = 7 \times 10^6$, $c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	C_{d_wake}
6910	1	0.801	0.778	0.00	20.2×10^6	-0.007	-0.007	0.0089



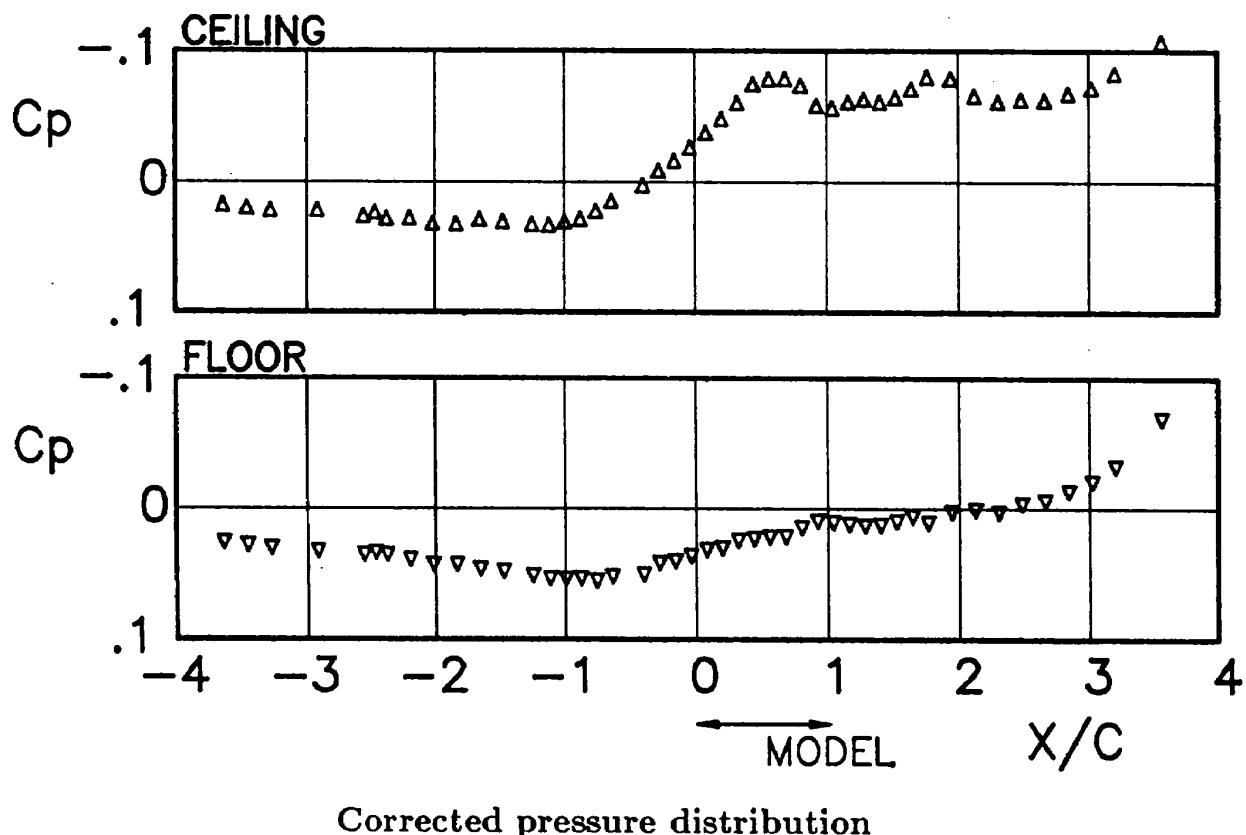
Corrected pressure distribution

x/c	Ceiling		Floor	
	C_p	C_{p_c}	C_p	C_{p_c}
-3.6400	0.0172	0.0175	0.0208	0.0212
-3.4600	0.0182	0.0185	0.0218	0.0223
-3.2800	0.0194	0.0197	0.0232	0.0236
-2.9200	0.0191	0.0195	0.0247	0.0252
-2.5600	0.0234	0.0238	0.0262	0.0267
-2.4700	0.0203	0.0207	0.0242	0.0247
-2.3800	0.0249	0.0254	0.0249	0.0254
-2.2000	0.0252	0.0257	0.0282	0.0287
-2.0200	0.0291	0.0296	0.0307	0.0313
-1.8400	0.0305	0.0311	0.0297	0.0303
-1.6600	0.0273	0.0279	0.0315	0.0321
-1.4800	0.0302	0.0308	0.0324	0.0331
-1.2520	0.0338	0.0345	0.0322	0.0328
-1.1200	0.0353	0.0360	0.0326	0.0332
-1.0000	0.0348	0.0355	0.0327	0.0334
-0.8800	0.0340	0.0346	0.0307	0.0313
-0.7600	0.0301	0.0307	0.0304	0.0310
-0.6400	0.0269	0.0274	0.0263	0.0269
-0.4000	0.0203	0.0207	0.0207	0.0211
-0.2800	0.0112	0.0114	0.0122	0.0125
-0.1600	0.0071	0.0072	0.0089	0.0091
-0.0400	0.0013	0.0014	0.0035	0.0036
0.0800	-0.0054	-0.0056	-0.0026	-0.0027

x/c	Ceiling		Floor	
	C_p	C_{p_c}	C_p	C_{p_c}
0.2000	-0.0090	-0.0092	-0.0029	-0.0030
0.3200	-0.0122	-0.0124	-0.0096	-0.0097
0.4400	-0.0146	-0.0149	-0.0107	-0.0109
0.5600	-0.0124	-0.0127	-0.0108	-0.0110
0.6800	-0.0112	-0.0114	-0.0129	-0.0131
0.8000	-0.0140	-0.0143	-0.0159	-0.0163
0.9200	-0.0132	-0.0134	-0.0150	-0.0153
1.0400	-0.0147	-0.0150	-0.0147	-0.0150
1.1600	-0.0159	-0.0162	-0.0161	-0.0164
1.2800	-0.0160	-0.0163	-0.0136	-0.0139
1.4000	-0.0159	-0.0162	-0.0148	-0.0151
1.5200	-0.0166	-0.0170	-0.0155	-0.0158
1.6400	-0.0202	-0.0206	-0.0208	-0.0212
1.7600	-0.0245	-0.0249	-0.0193	-0.0197
1.9400	-0.0272	-0.0278	-0.0187	-0.0190
2.1200	-0.0223	-0.0228	-0.0146	-0.0149
2.3000	-0.0194	-0.0198	-0.0161	-0.0164
2.4800	-0.0224	-0.0228	-0.0184	-0.0187
2.6600	-0.0268	-0.0273	-0.0220	-0.0224
2.8400	-0.0328	-0.0335	-0.0295	-0.0301
3.0200	-0.0421	-0.0429	-0.0364	-0.0371
3.2000	-0.0519	-0.0529	-0.0461	-0.0470
3.5600	-0.0821	-0.0837	-0.0725	-0.0739

Fig. 69 Wall pressure distributions at zero angle of attack ($c = 250$ mm).

Run	Scan	M_s	M_c	α_s (deg)	Re	C_{l_u}	C_{l_c}	$C_{d_{wake}}$
6910	2	0.801	0.778	1.91	20.3×10^6	0.285	0.290	0.0187



Corrected pressure distribution

x/c	Ceiling		Floor	
	Cp	C _{Pc}	Cp	C _{Pc}
-3.6400	0.0195	0.0199	0.0236	0.0240
-3.4600	0.0214	0.0218	0.0256	0.0260
-3.2800	0.0233	0.0237	0.0278	0.0283
-2.9200	0.0231	0.0236	0.0301	0.0307
-2.5600	0.0276	0.0282	0.0326	0.0332
-2.4700	0.0249	0.0253	0.0311	0.0317
-2.3800	0.0296	0.0302	0.0326	0.0332
-2.2000	0.0292	0.0298	0.0361	0.0368
-2.0200	0.0333	0.0339	0.0399	0.0407
-1.8400	0.0337	0.0344	0.0398	0.0406
-1.6600	0.0301	0.0306	0.0432	0.0440
-1.4800	0.0318	0.0324	0.0449	0.0458
-1.2520	0.0339	0.0346	0.0482	0.0492
-1.1200	0.0344	0.0351	0.0503	0.0513
-1.0000	0.0318	0.0324	0.0508	0.0517
-0.8800	0.0299	0.0305	0.0503	0.0513
-0.7600	0.0238	0.0243	0.0521	0.0531
-0.6400	0.0163	0.0166	0.0488	0.0497
-0.4000	0.0044	0.0045	0.0472	0.0481
-0.2800	-0.0069	-0.0071	0.0388	0.0396
-0.1600	-0.0141	-0.0143	0.0374	0.0381
-0.0400	-0.0241	-0.0246	0.0334	0.0340
0.0800	-0.0353	-0.0360	0.0288	0.0294

x/c	Ceiling		Floor	
	Cp	C _{Pc}	Cp	C _{Pc}
0.2000	-0.0454	-0.0463	0.0277	0.0282
0.3200	-0.0575	-0.0586	0.0219	0.0223
0.4400	-0.0719	-0.0733	0.0207	0.0211
0.5600	-0.0755	-0.0769	0.0194	0.0198
0.6800	-0.0759	-0.0773	0.0191	0.0195
0.8000	-0.0710	-0.0724	0.0123	0.0125
0.9200	-0.0557	-0.0567	0.0075	0.0077
1.0400	-0.0537	-0.0548	0.0086	0.0087
1.1600	-0.0583	-0.0594	0.0098	0.0100
1.2800	-0.0605	-0.0617	0.0110	0.0112
1.4000	-0.0582	-0.0594	0.0105	0.0107
1.5200	-0.0618	-0.0630	0.0078	0.0079
1.6400	-0.0683	-0.0696	0.0039	0.0040
1.7600	-0.0773	-0.0788	0.0087	0.0089
1.9400	-0.0761	-0.0776	0.0004	0.0004
2.1200	-0.0629	-0.0642	-0.0010	-0.0010
2.3000	-0.0586	-0.0597	0.0009	0.0009
2.4800	-0.0601	-0.0613	-0.0056	-0.0057
2.6600	-0.0596	-0.0608	-0.0078	-0.0079
2.8400	-0.0647	-0.0660	-0.0149	-0.0152
3.0200	-0.0690	-0.0704	-0.0222	-0.0226
3.2000	-0.0799	-0.0814	-0.0336	-0.0342
3.5600	-0.1037	-0.1057	-0.0697	-0.0710

Fig. 70 Wall pressure distributions in lifting condition ($c = 250$ mm).

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