

Progress report of the initial description for Hayabusa-returned samples

(「はやぶさ」帰還粒子の初期記載作業の進捗報告)

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ABSTRACT

The Extraterrestrial Sample Curation Team (ESCuTe) of JAXA is working on the initial description of Hayabusa-returned sample. In this year, ESCuTe made the scanning electron microscope (SEM) holder with which we could observe the cover of the sample catcher B room directly by SEM, and worked on the initial description by SEM observation for the B room cover. In this way, more than 600 particles were observed so far.

More than 100 particles which have been made the initial description by ESCuTe were allocated for the 1st and the 2nd international announcement of opportunities (AOs), and are studied energetically by the researchers.

Introduction

Works of ESCuTe of JAXA

1. The initial description of Hayabusa-returned sample
 - Shape, size observation and composition analysis by FESEM/EDS
 - Technology development for the routine of the initial description method
2. Sample allocation for NASA, international AO
3. Research for Hayabusa-returned sample
4. Technology development for sample storage
5. Maintenance for the curation facility

The number of particles made a catalogue

Revised in July 24, 2013

Category	Room A	Room B	Total	Percentage
1	150	106	253	60%
2	61	18	79	18%
3 (carbon)	17	35	52	12%
4 (artificial)	19	24	42	10%
1-4 total	247	183	430	

The number of particles of allocated

- Preliminary examination : 69
 - 1st round : 57
 - 2nd round : 6
 - Category 3 : 6
- International AO : 108
 - 1st round (2012) : 60
 - 2nd round (2013) : 48
- NASA : 25
 - 1st round (2012) : 15
 - 2nd round (2013) : 10
- JAXA : 30
 - Outreach : 3
 - JAXA : 12
 - Consortium studies : 15

Progress of international AO researches

- 1st AO (17 themes, 60 particles)

6 papers

Nakashima et al. (2013) EPSL (Oxygen isotopes)

Noguchi et al. (2014) MAPS (Space weathering)

Mikouchi et al. (2014) EPS (accepted) (MIN/PET description)

Langenhorst et al. (2014) EPS (accepted) (Mineralogy and defect microstructure)

Keller et al. (2014) EPS (TEM observation for Itokawa particle)

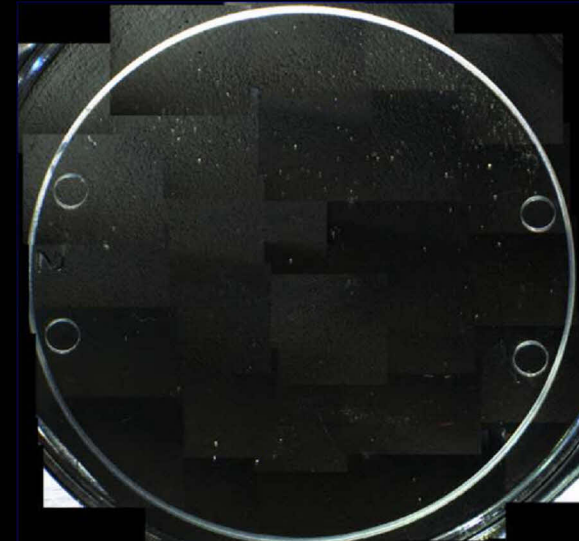
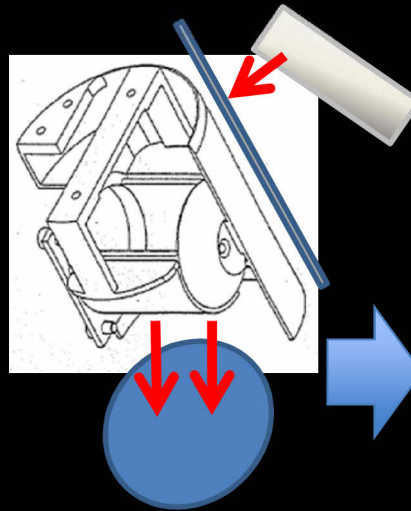
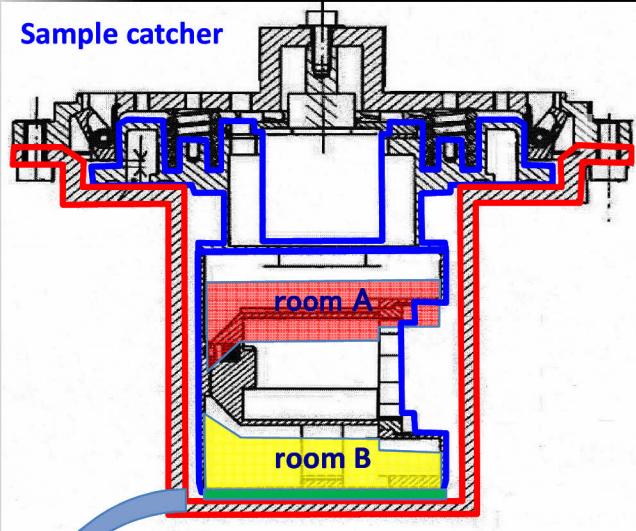
Thompson et al. (2014) EPS (accepted) (Microchemical and structural observation)

Presentation for conferences: 50 titles

- 2nd AO (15 themes, 48 particles)

Presentation for conferences: 6 titles

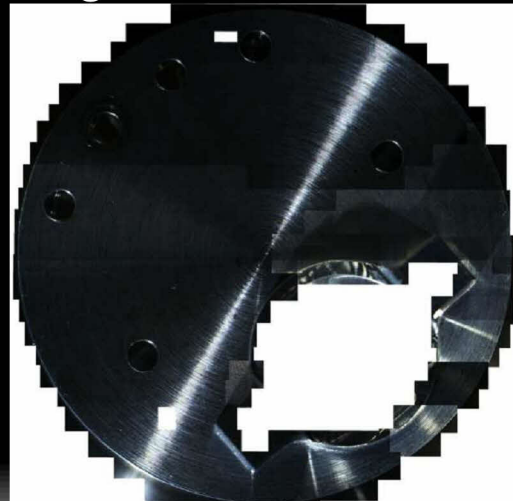
Particle recovery from the cathcer



Recover the glass disk and observe

Set a quartz glass disk to the opening of each room of the catcher and tap it to let particles inside fall onto the glass disk.

the cover of room B

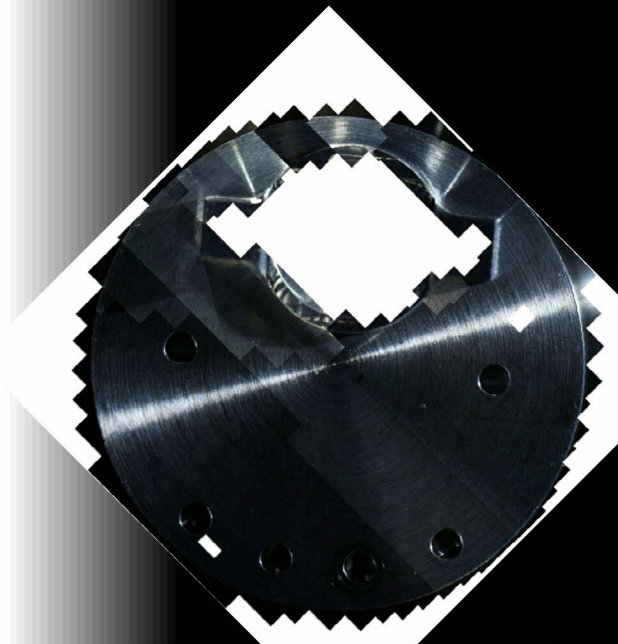


Recover the original Room B's cover and observe



Pick up particles one by one with a manipulator

The initial description for the cover of room B



the cover of room B

$\phi 48\text{mm}$

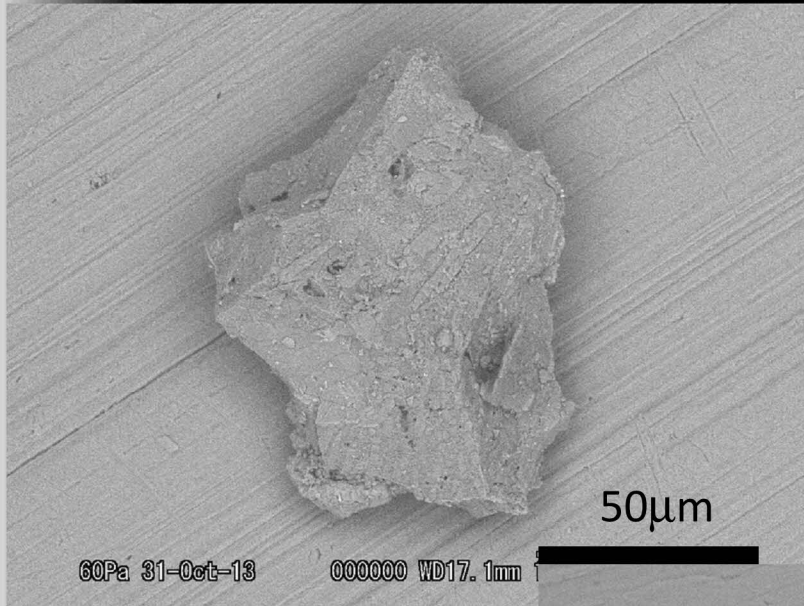
SEM
observation,
directly



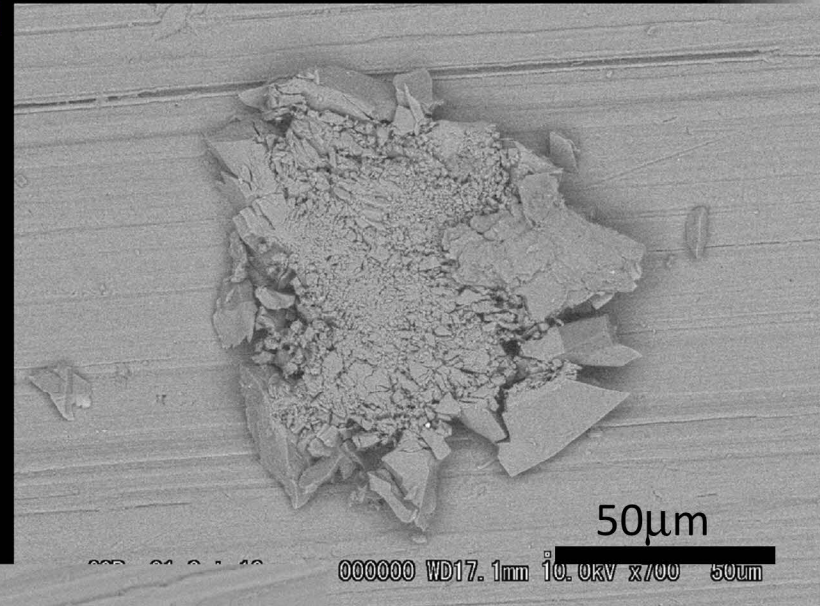
SEM mapping

SEM mosaic image of the cover.
The ability for particle distinction in this way
improved markedly

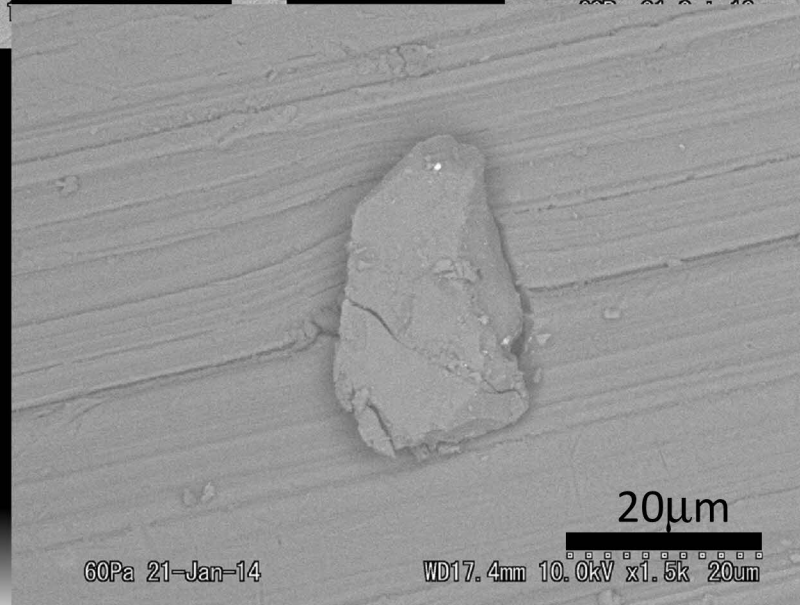
States of the particles observed by SEM



↑The particle can be handled without a problem



↑The particle cannot be handled because of crashed



←The particle cannot be handled because of buried

Progress of the description for room B cover

Revised in July 31, 2014

Category	Total	Percentage	Allocatable
1+2	279	44.9%	47
3 (carbon)	33	5.5%	
4 (artificial)	303	48.8%	
others	6	1.0%	
total	621		



HAYABUSA 2014

Symposium of Solar System Materials

You are all invited to participate the international science symposium of Itokawa origin and solar system evolution!

Date:

- 4-5 December 2014

Venue:

- JAXA Sagamihara Campus

<http://www.isas.jaxa.jp/e/about/center/sagami/access.shtml>

Scope:

- Results from Hayabusa sample analysis
- New insights from solar system material analysis
- Perspectives of solar system evolution by theoretical, observational and experimental studies
- Technique and methodology of sample analysis
- Other related studies

Important Dates:

- | | |
|---------------------|---------------------|
| - Call for abstract | 15 Jul. 2014 |
| - Abstract deadline | <u>31 Aug. 2014</u> |
| - Meeting period | 4-5 Dec. 2014 |
| - Proceedings due | 28 Feb. 2015 |

Registration:

- Anybody interested in these topics is welcomed.
- Registration fee is *free!*

LOC:

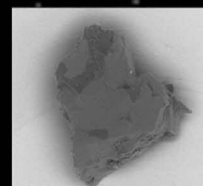
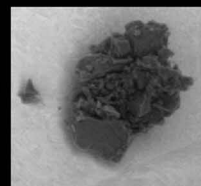
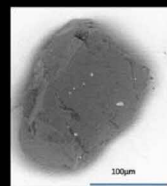
- Extraterrestrial Sample curation team, ISAS/JAXA
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Harold C. Connolly Jr. (CUNY)
Hideyasu Kojima (NIPR)
Hideaki Miyamoto (Univ. Tokyo)



Summary

- We made the SEM holder with which we could observe the cover of the sample catcher B room directly by SEM.
- We worked on the initial description by SEM observation for the B room cover.
- We observed more than 600 particles on the B room cover so far.
- We allocated more than 100 particles for the international AOs, and the researchers study energetically.