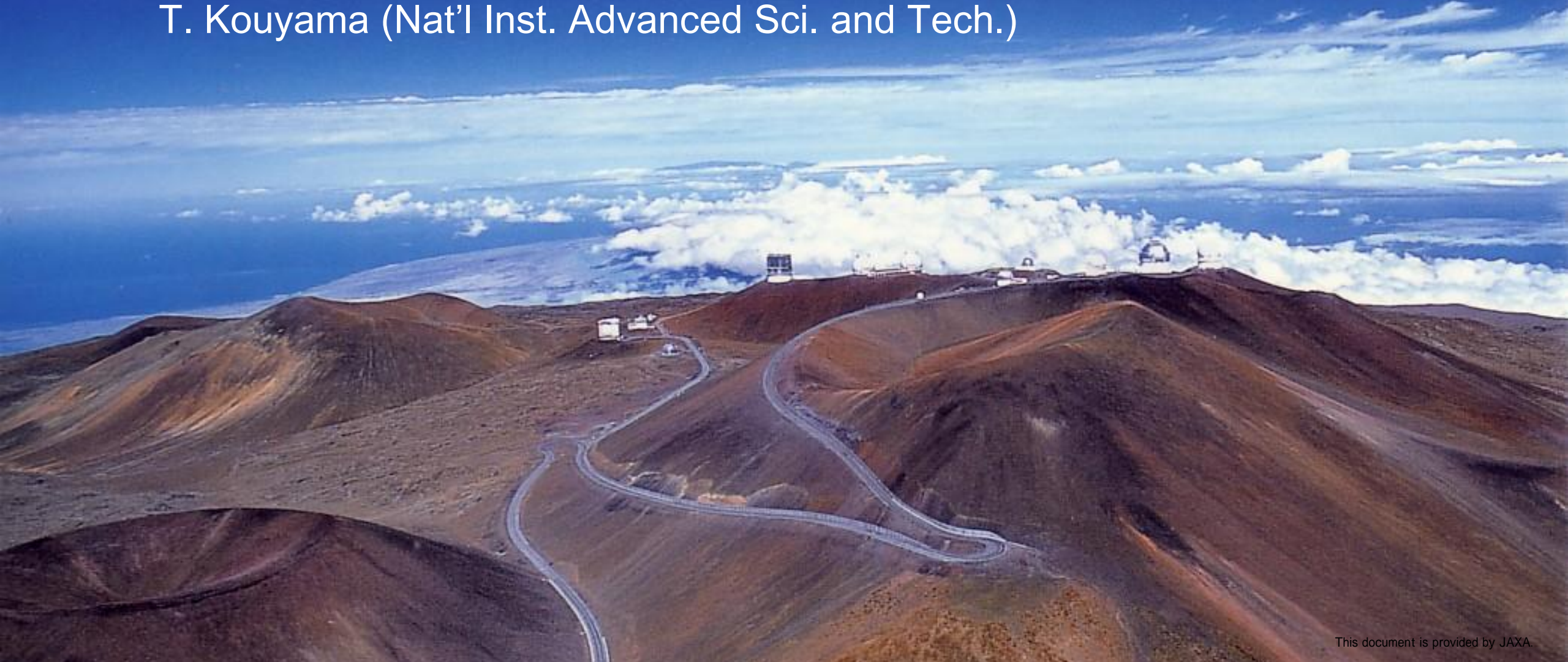


Ground-based 5 μ m observation of waves in the Venus atmosphere

S.Kano, N.Iwagami, M. Hosouchi (Univ. Tokyo) and
T. Kouyama (Nat'l Inst. Advanced Sci. and Tech.)



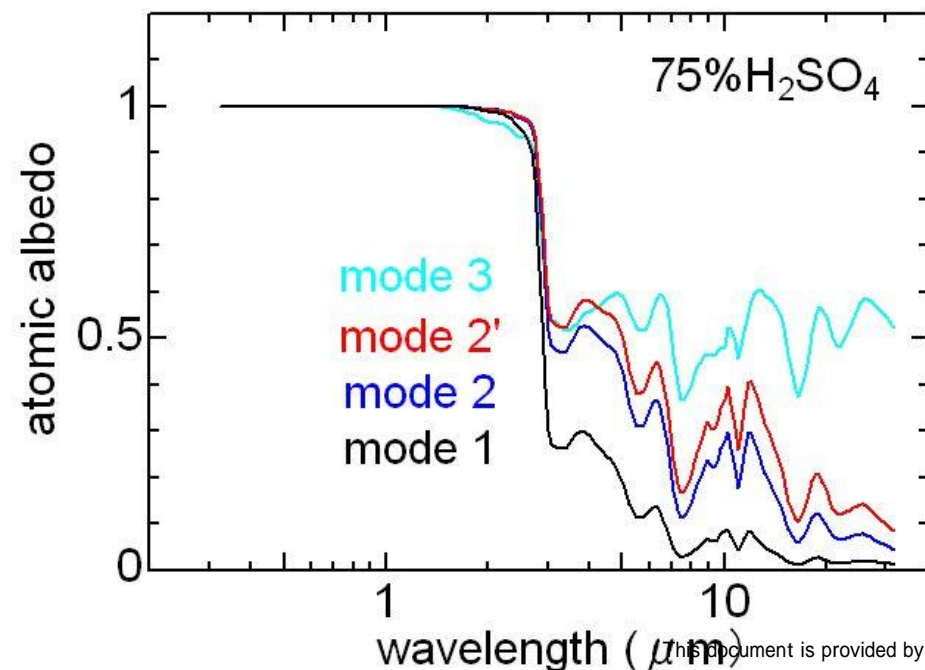
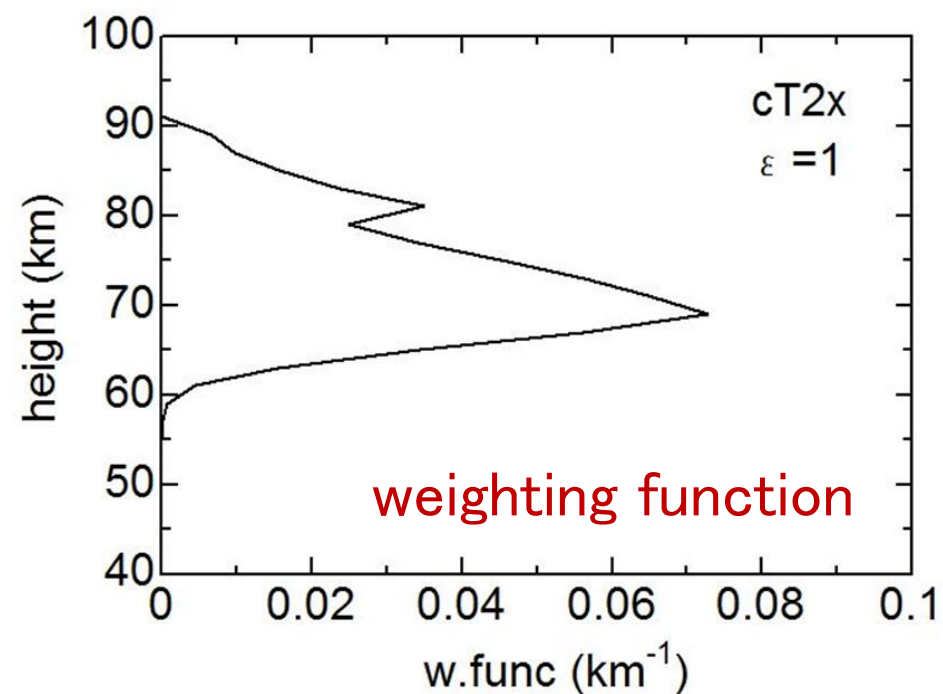
We want to see vertical structure
and propagation of waves in the cloud region

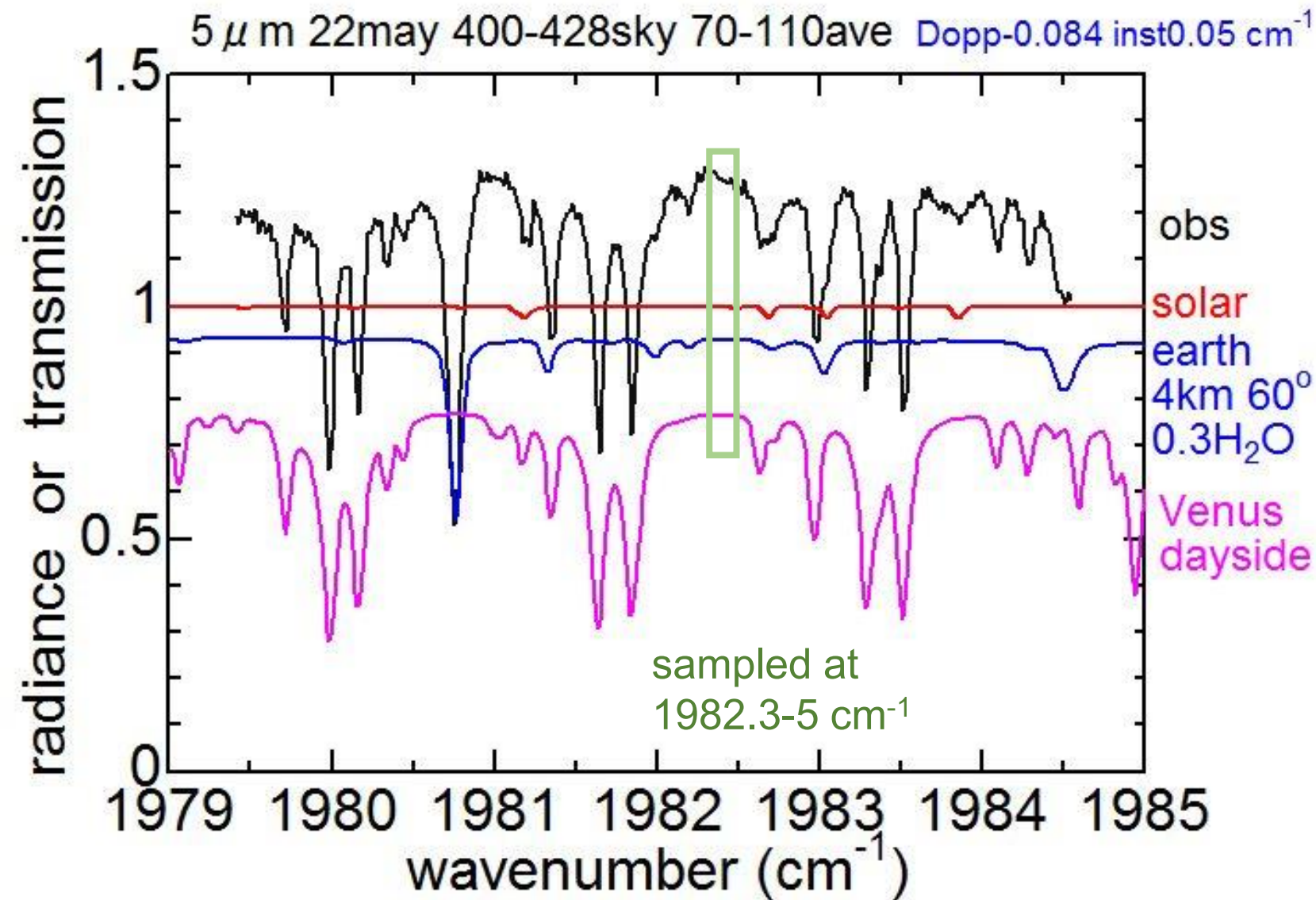
Most obs are for 70km by UV
60km info is rare but $1.7\mu\text{m}$ can do

At first we planned collaboration with VMC/VEX but was cancelled.

Alternately we changed to use $5\mu\text{m}$ radiance instead of UV for 70km info.

At $5\mu\text{m}$, 70km height region is seen because of black cloud with $\tau=1$ at 70km (at $1.7\mu\text{m}$ cloud is white)

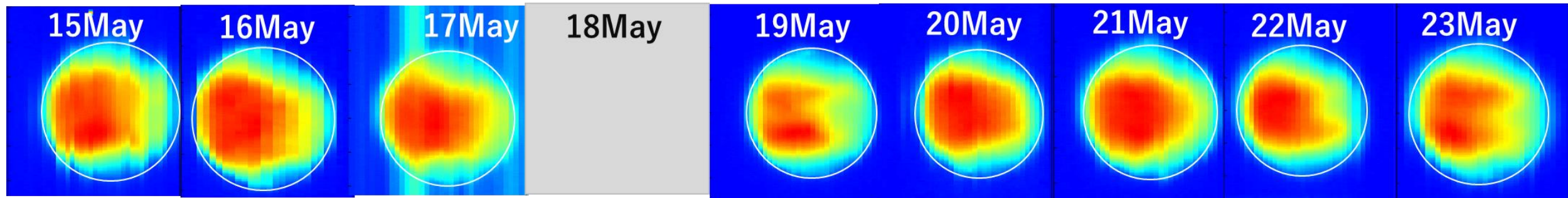




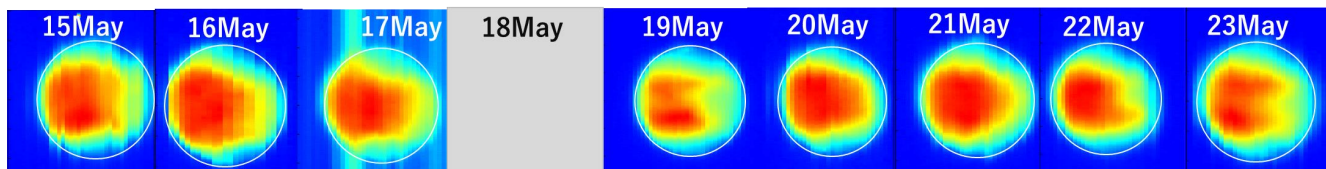
5 μ m spectrum is reproduced well indicating our right understanding

5 μ m radiance

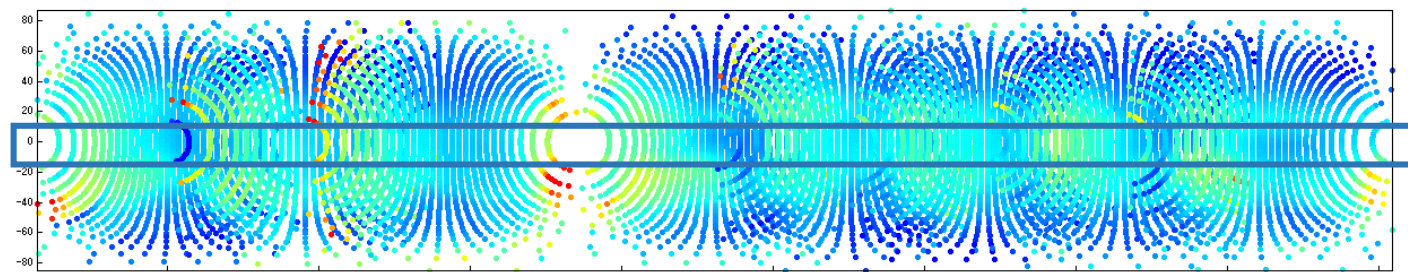
4day like variation is seen \rightarrow realistic



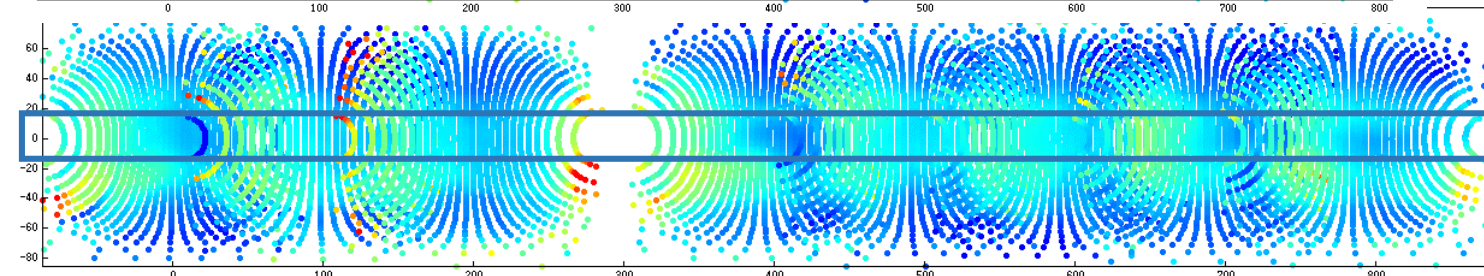
Fined out wavenumber 1 structure in the equatorial region by changing the day-by-day shift



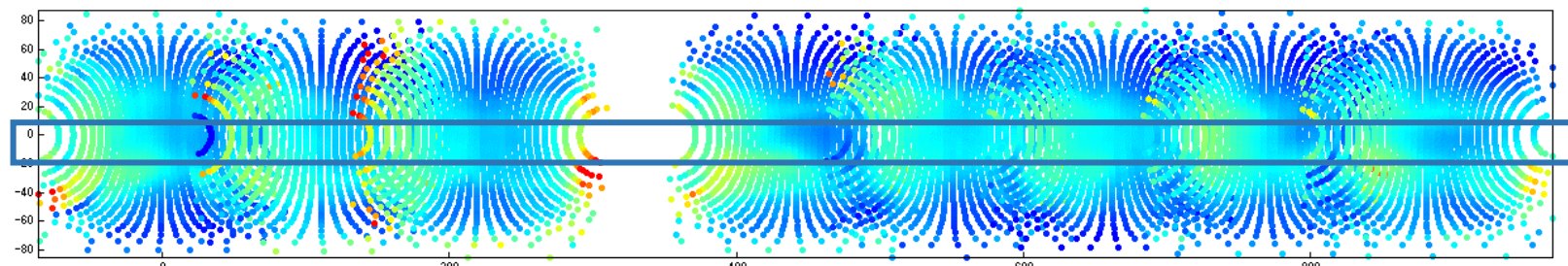
Connected Lon-Lat plot of radiance



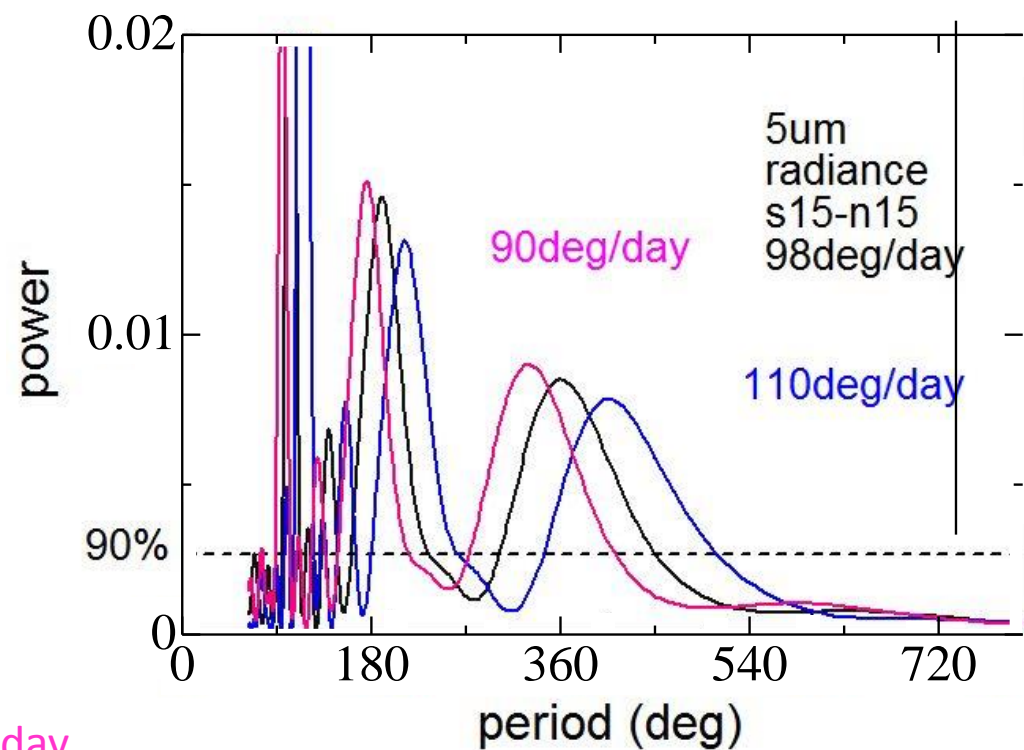
90°/day



98°/day

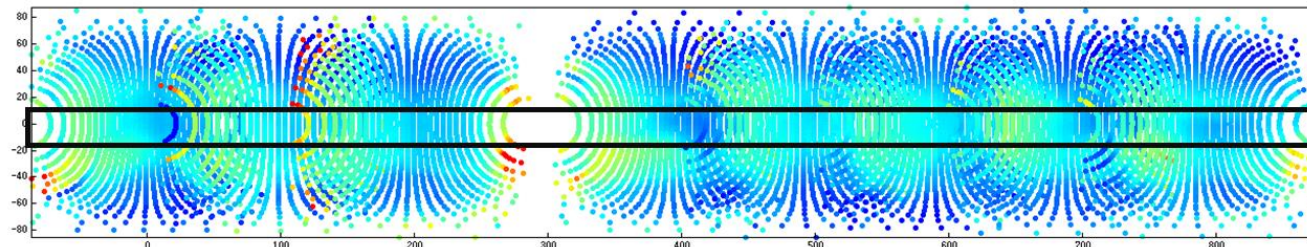


110°/day

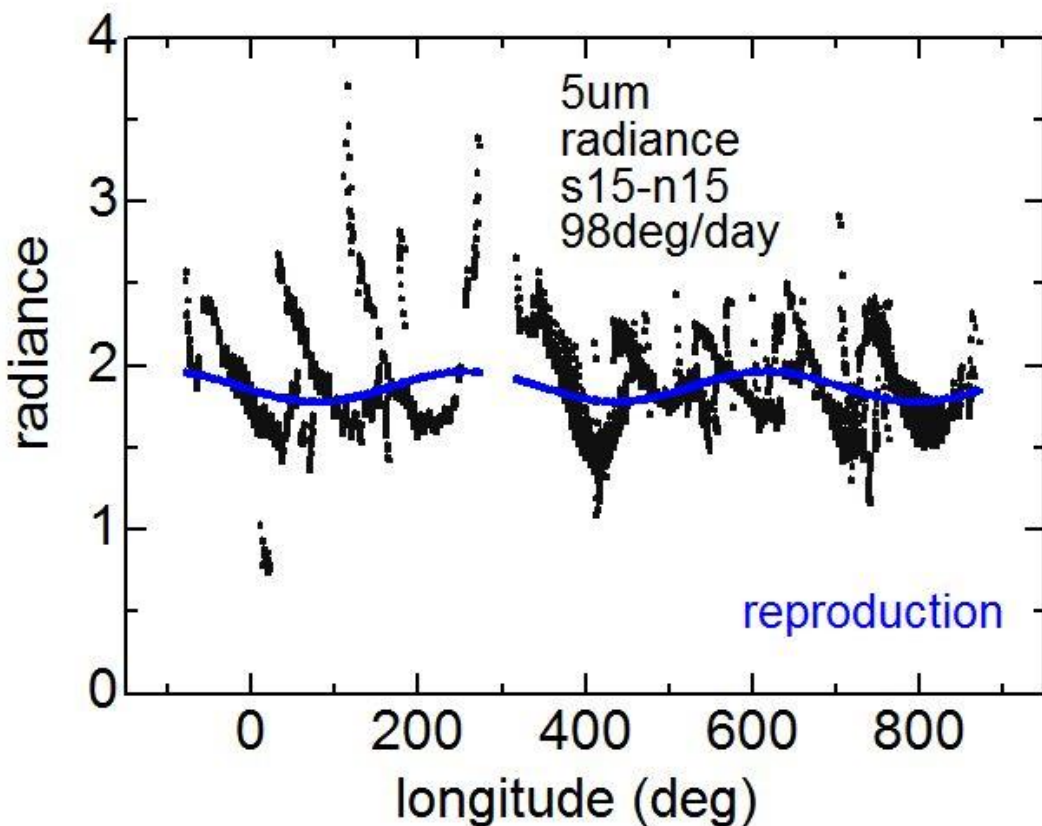


98deg/day shift gives a wavenumber 1 structure

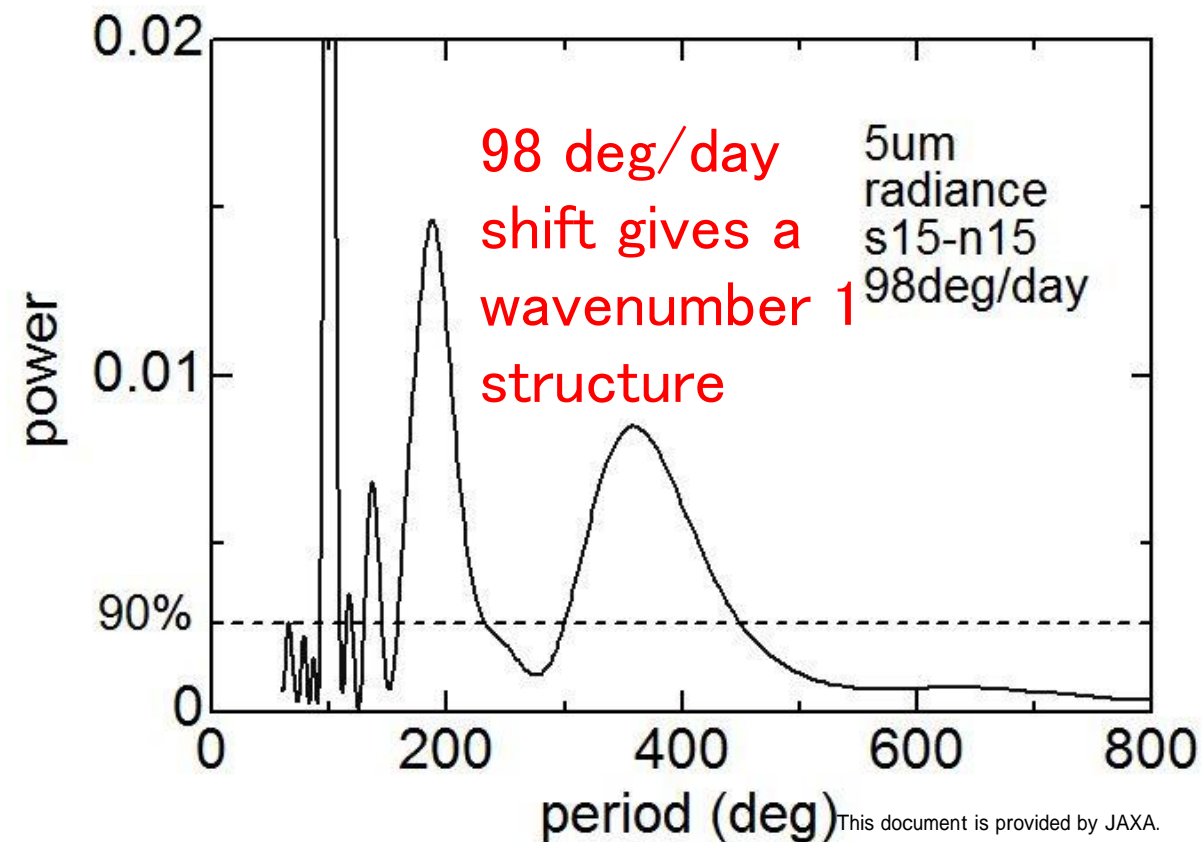
5 μ m periodogram for equatorial region (s15-n15) shows 3.7 days period at 70km



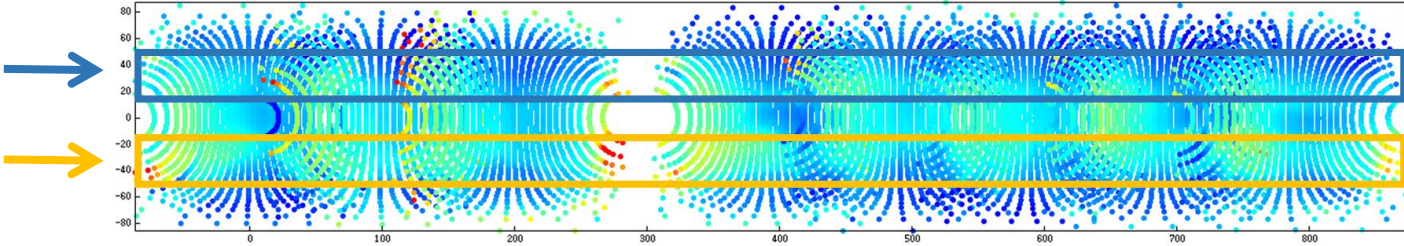
5 μ m radiance 15°S-15°N



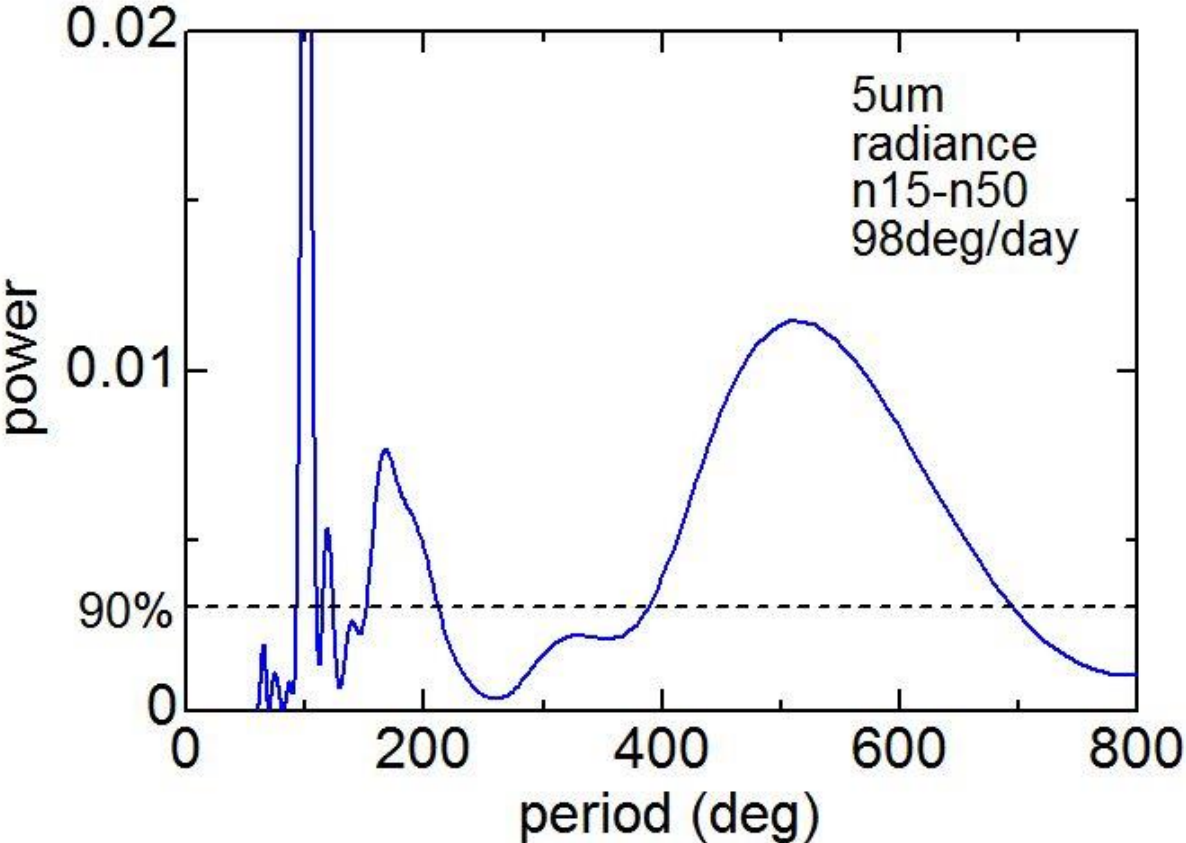
5 μ m radiance 15°S-15°N power spectrum



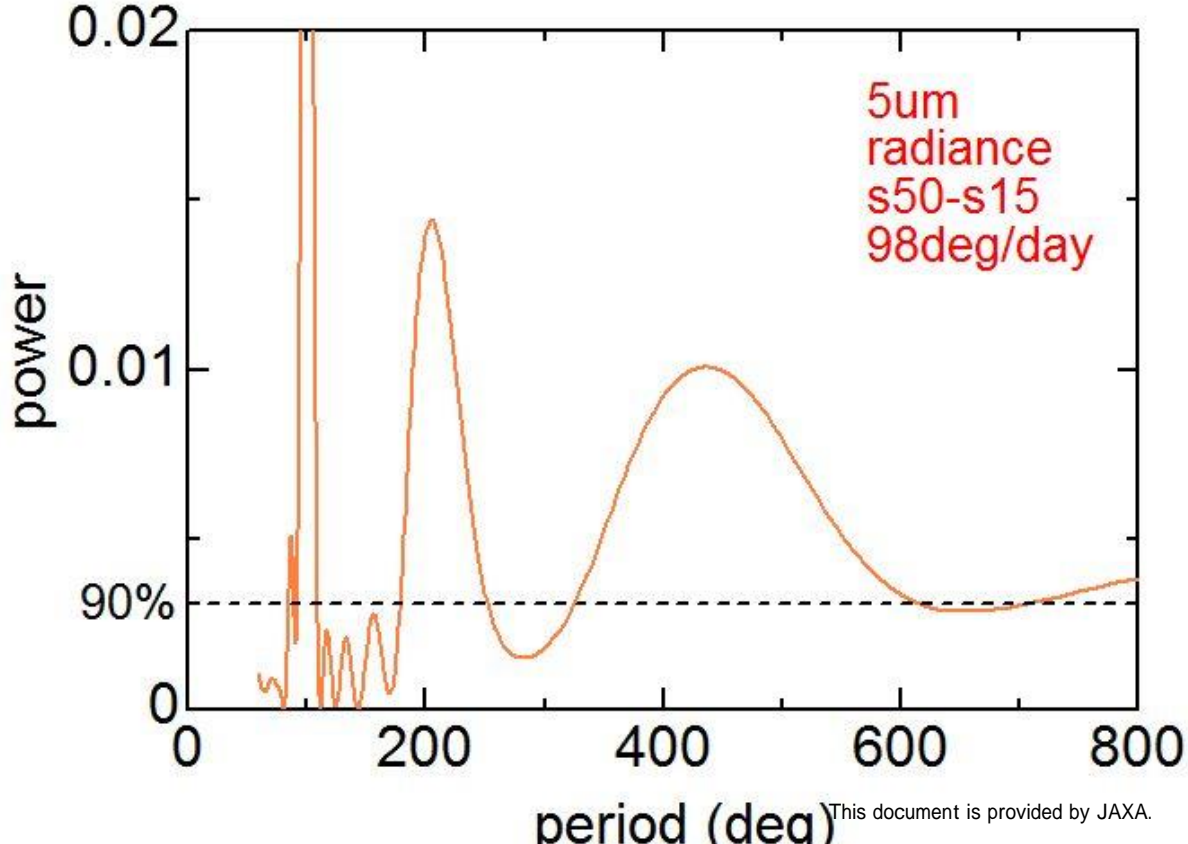
5 μ m periodogram for mid-lat (n15-n50, s15-s50) show different periods



5 μ m radiance 15°N-50°N power spectrum

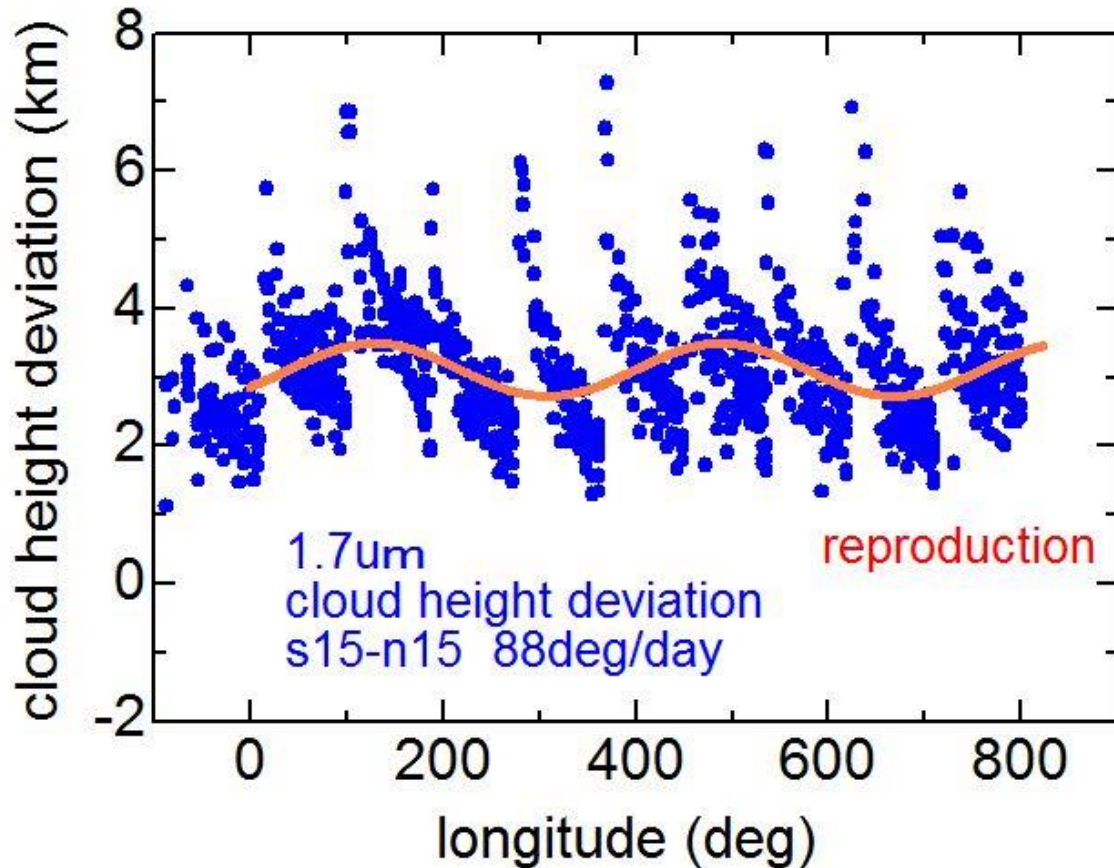


5 μ m radiance 15°S-50°S power spectrum

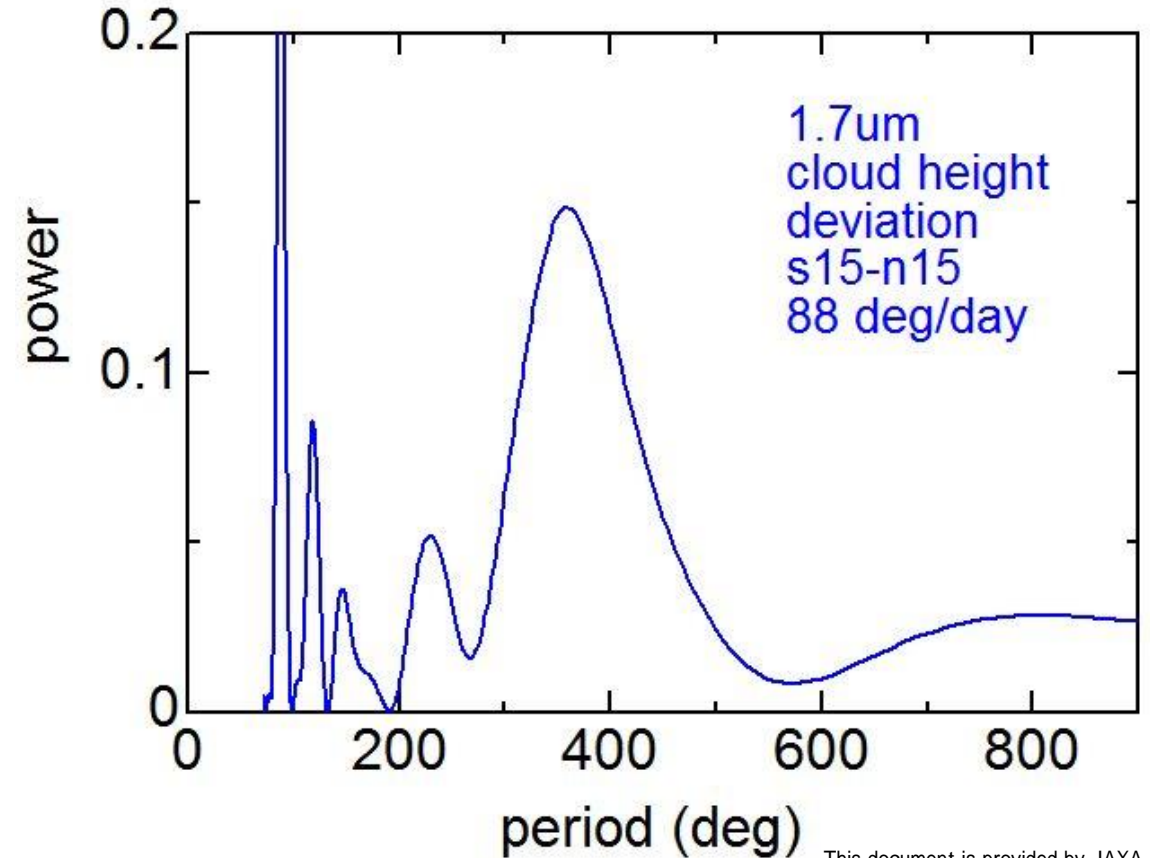


1.7 μ m periodogram for equatorial region (s15-n15) shows 4.1 days period at 60km

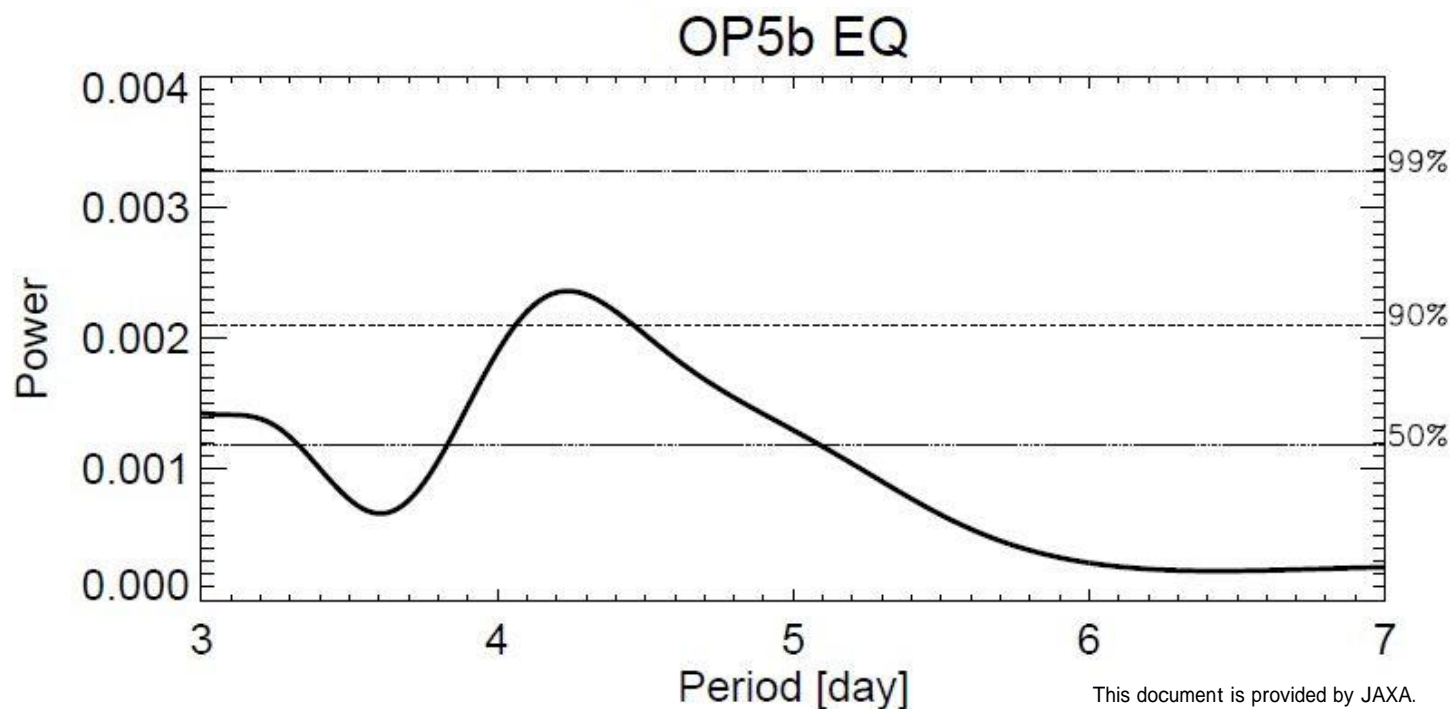
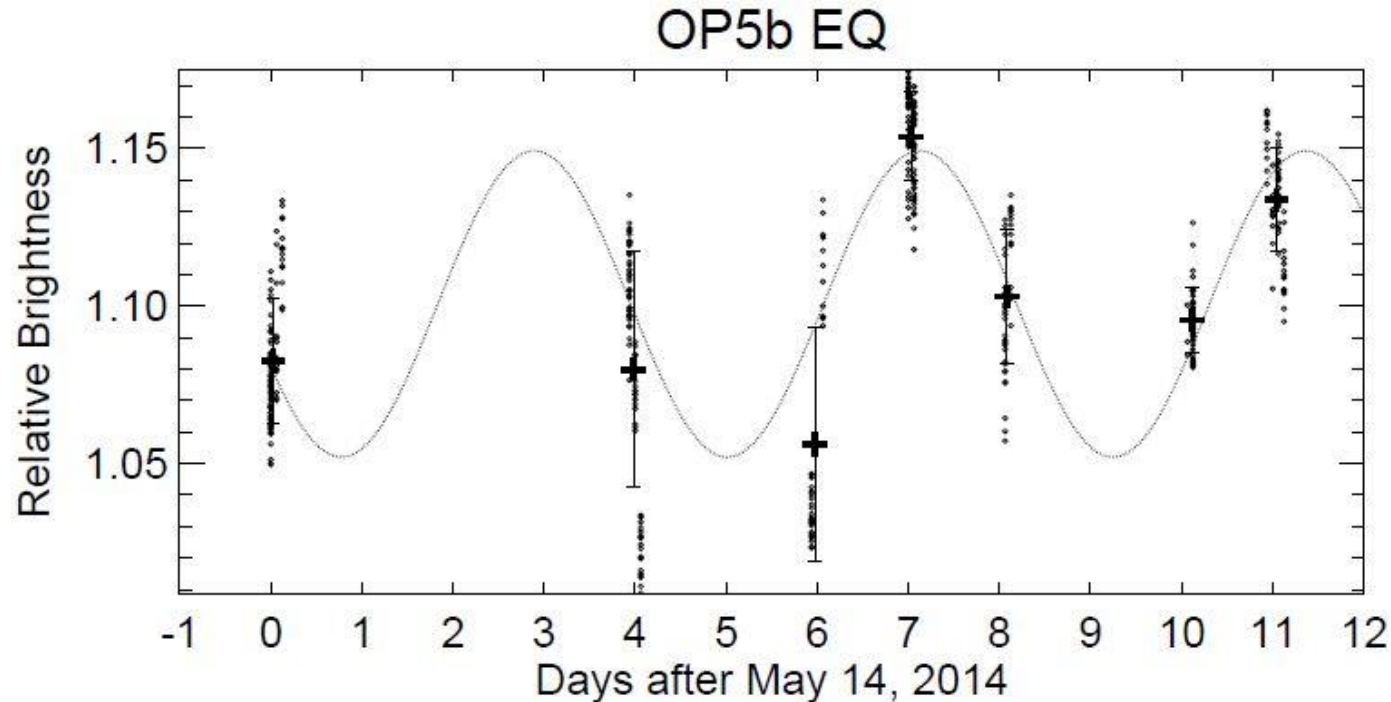
1.7 μ m radiance 15°S-15°N



1.7 μ m radiance 15°S-15°N power spectrum



PIRKA UV radiance shows 4.2 days period at 70km (after Imai personal communication)



Peralta et al 2014 shows possibility of waves having 4 days period and wavenumber 1 (38000km wavelength)

Among possible waves, inertial wave may have a vertical wave length more than 10km

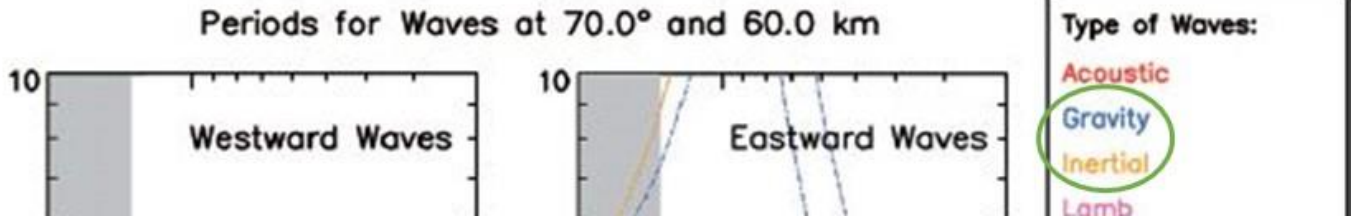
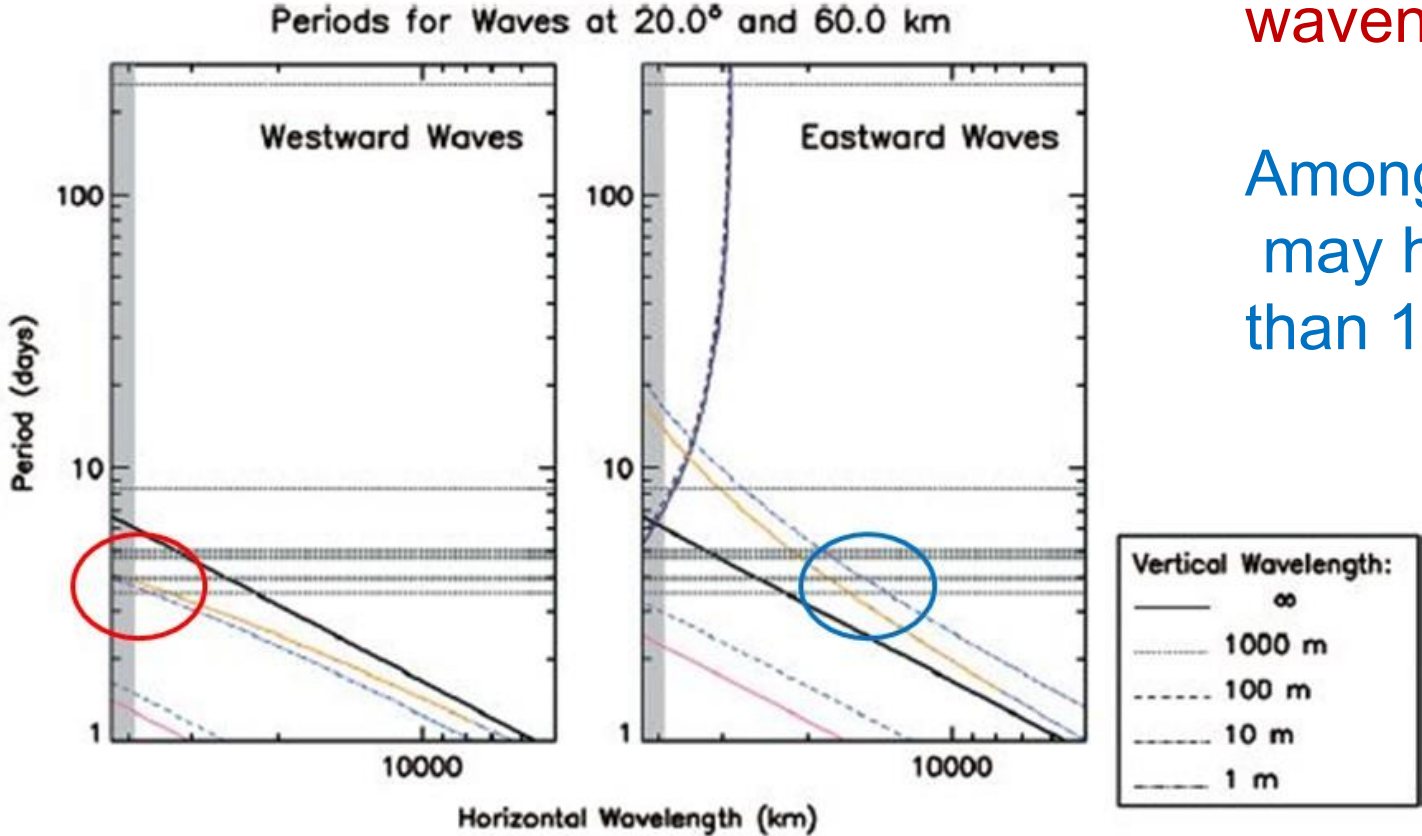


Fig4 of Peralta 2014

Comparison	1.7 μ m 60km	5 μ m 70km	UV 70km
period (days)	4.1	3.7	4.2
ground-speed(m/s)	108 \pm 11	120 \pm 12	105 \pm 11
BG wind speed(m/s)*	80	96	96
Intrinsic speed(m/s)	28 \pm 11	24 \pm 12	19 \pm 11

* after Fig.1 of Peralta et al. 2014

Conclusion

- 1 Within error, ground-speeds coincide each other
- 2 All are pro-grade
- 3 They seem to be the same wave

END

Thank you for listening