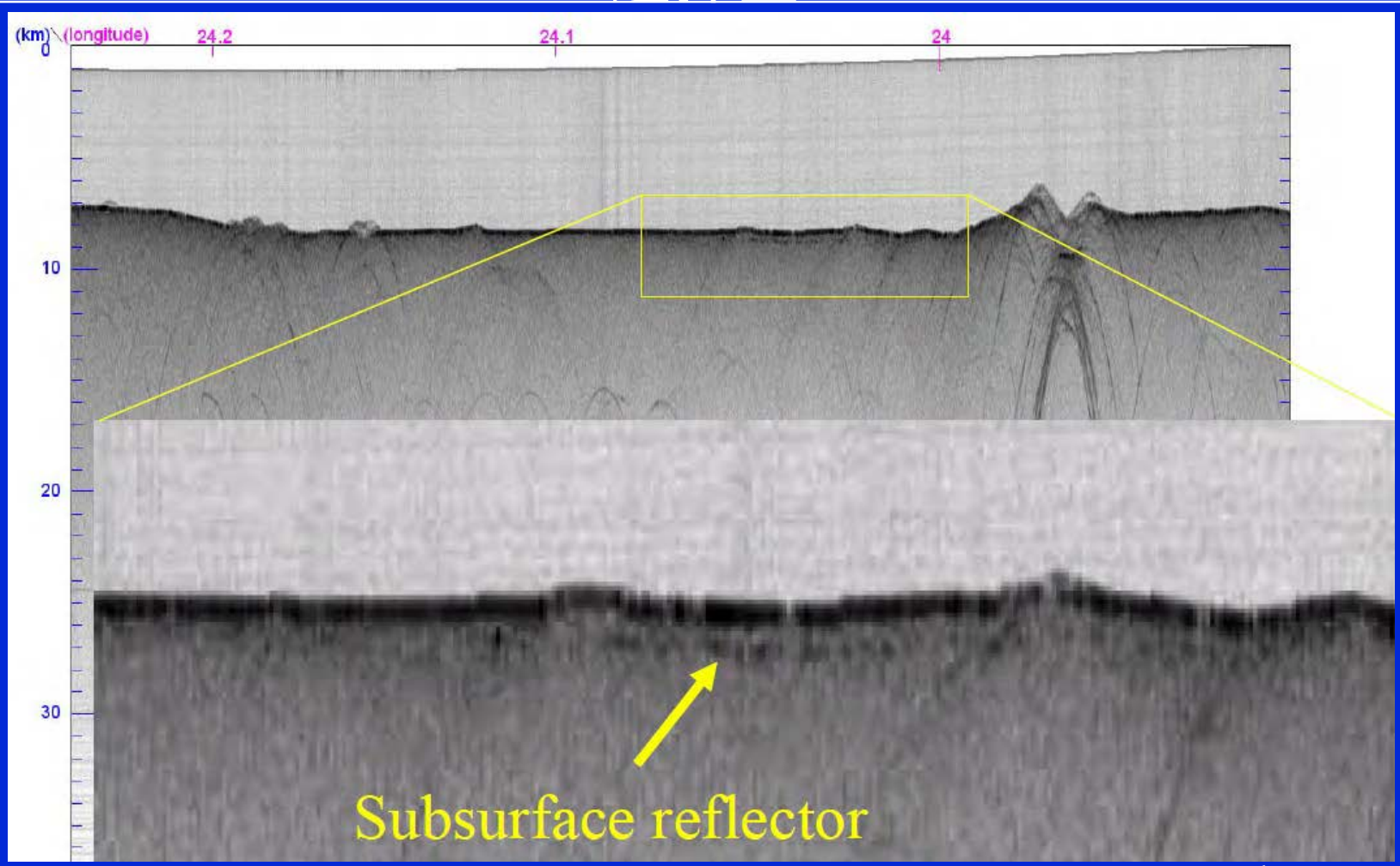
SELenological and ENgineering Explorer

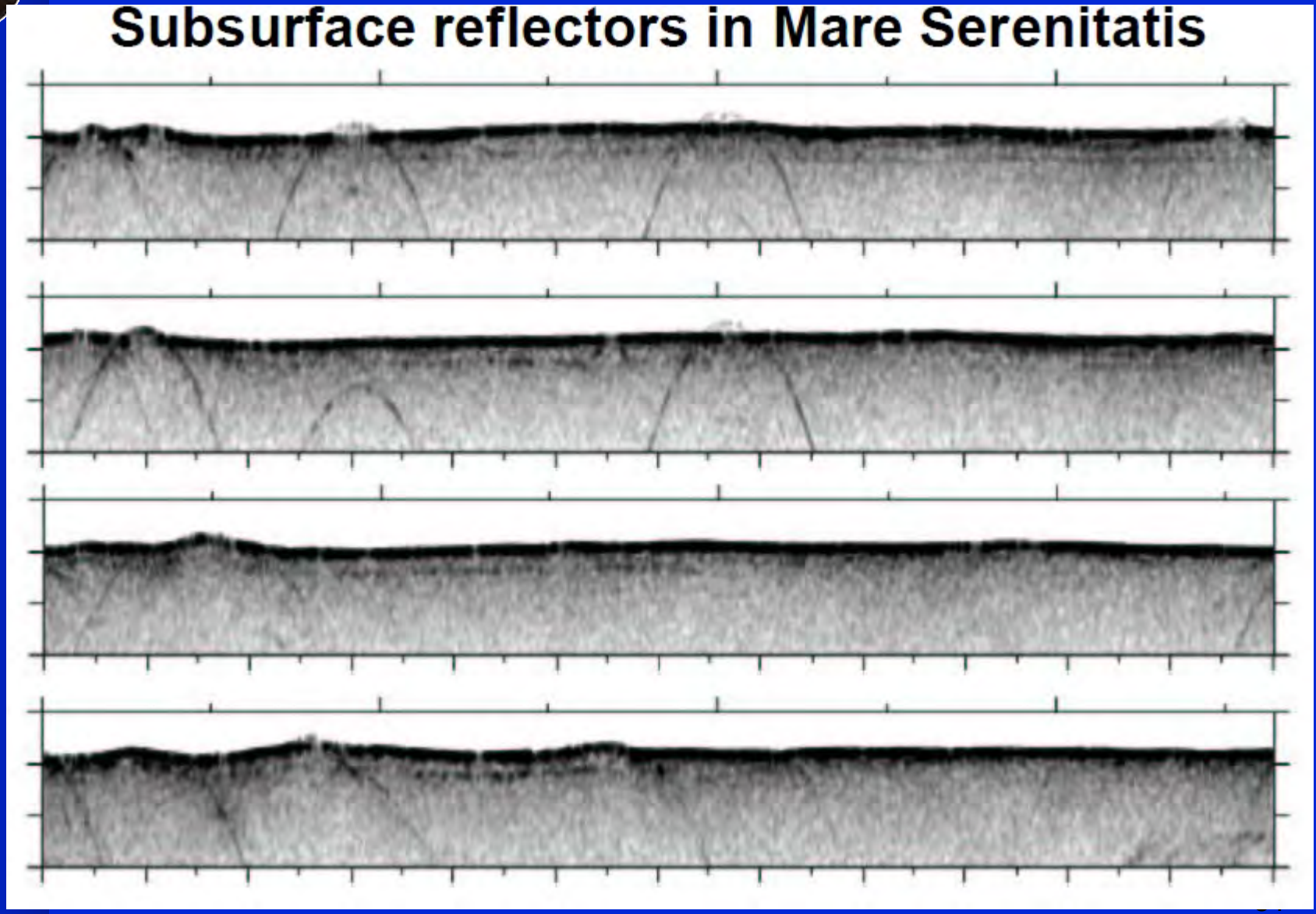
レーダサウンダーLRSによる静かの海の地下構造探査



Ono et al., 2008

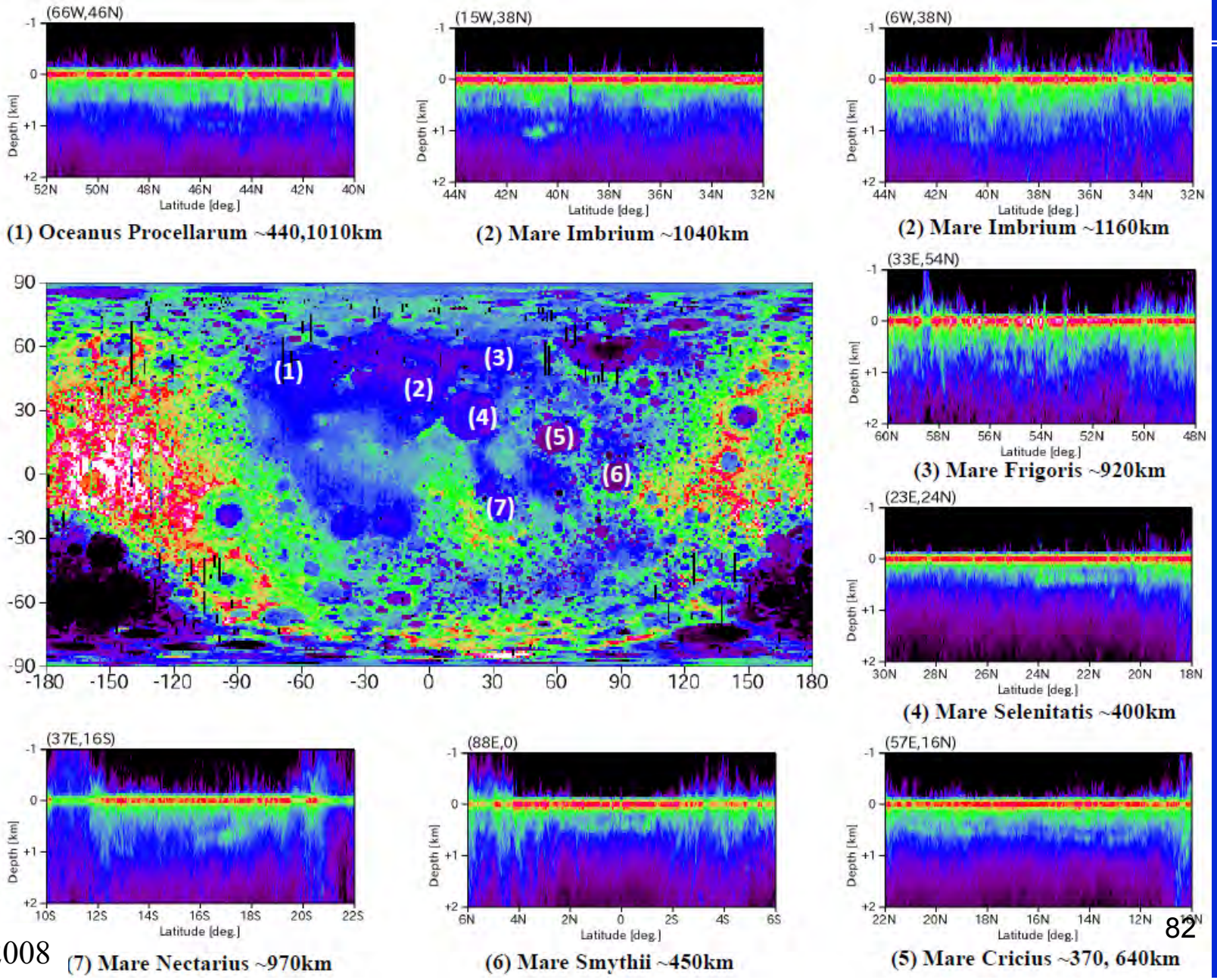
SELenological and ENgineering Explorer

静かの海地下探査、拡大図



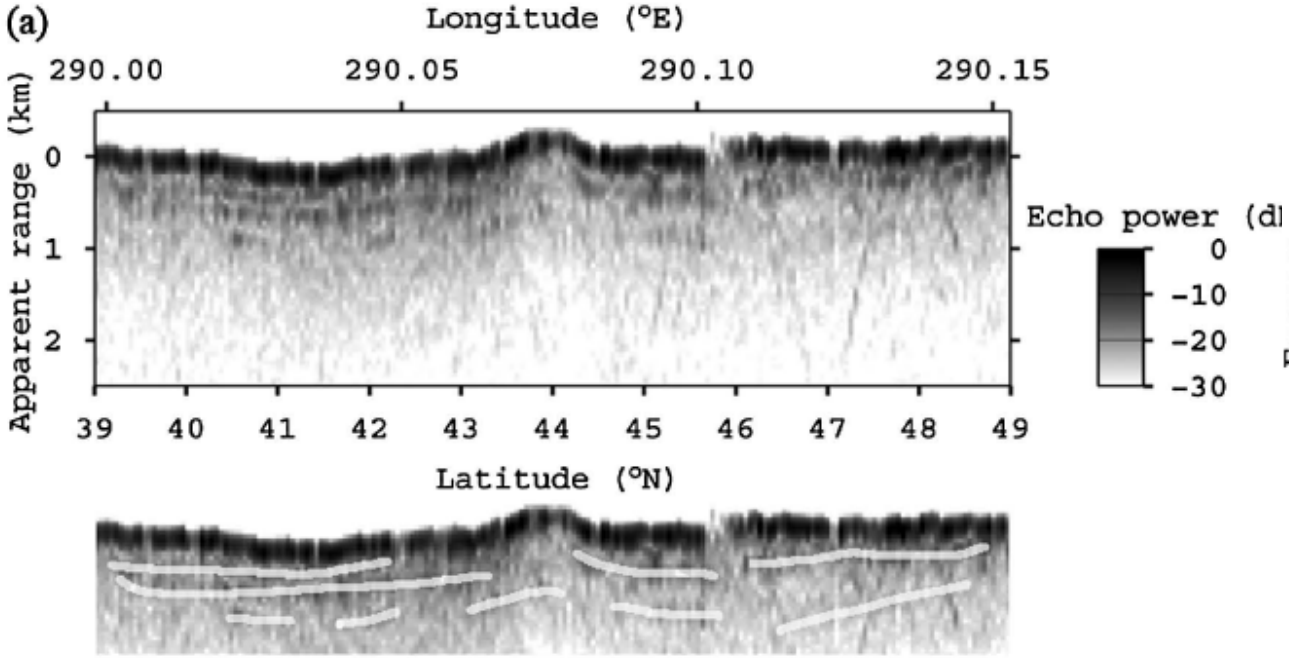
レーダサウンダーによる海の地下構造の測定

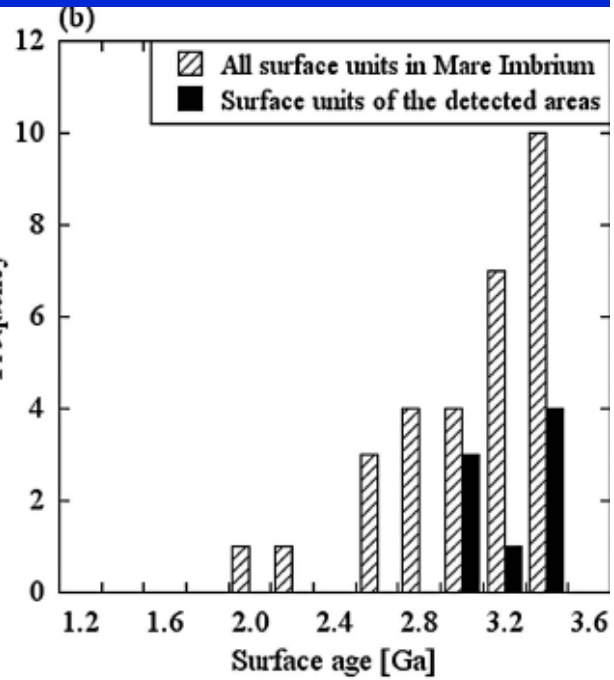
SELenological and ENgineering Explorer

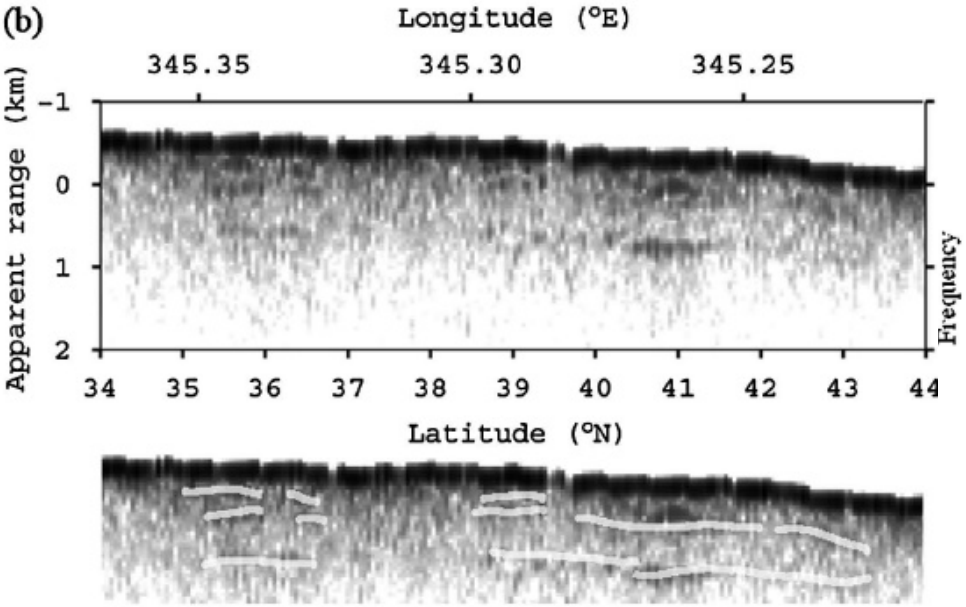


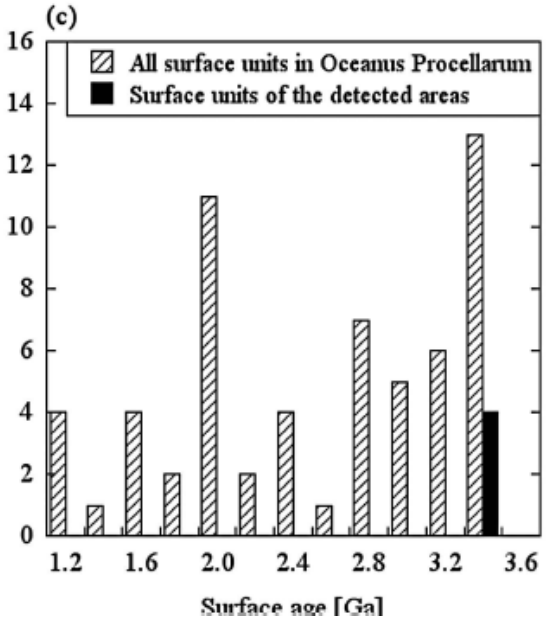
Ono et al., 2008

雨の海 & 嵐の大洋



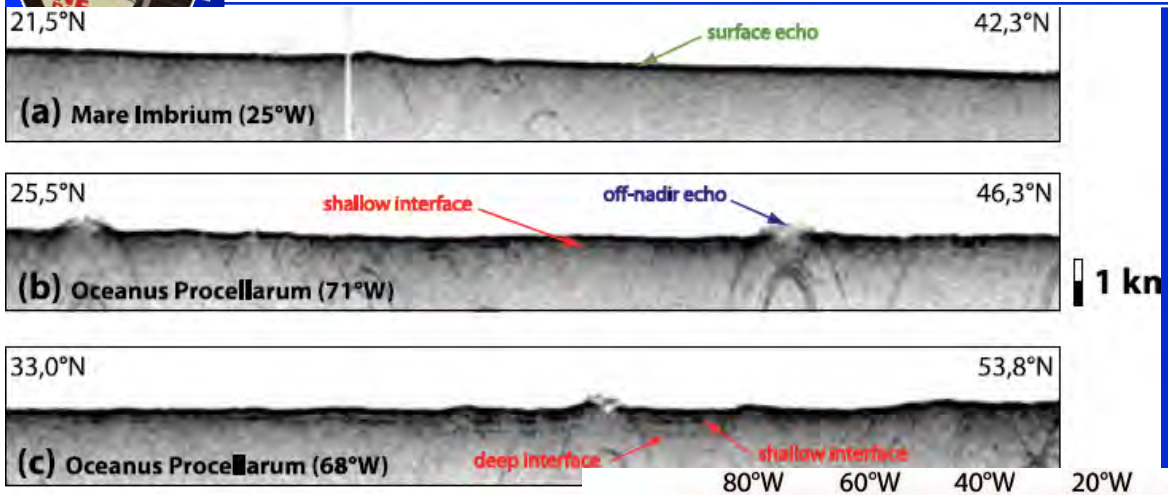






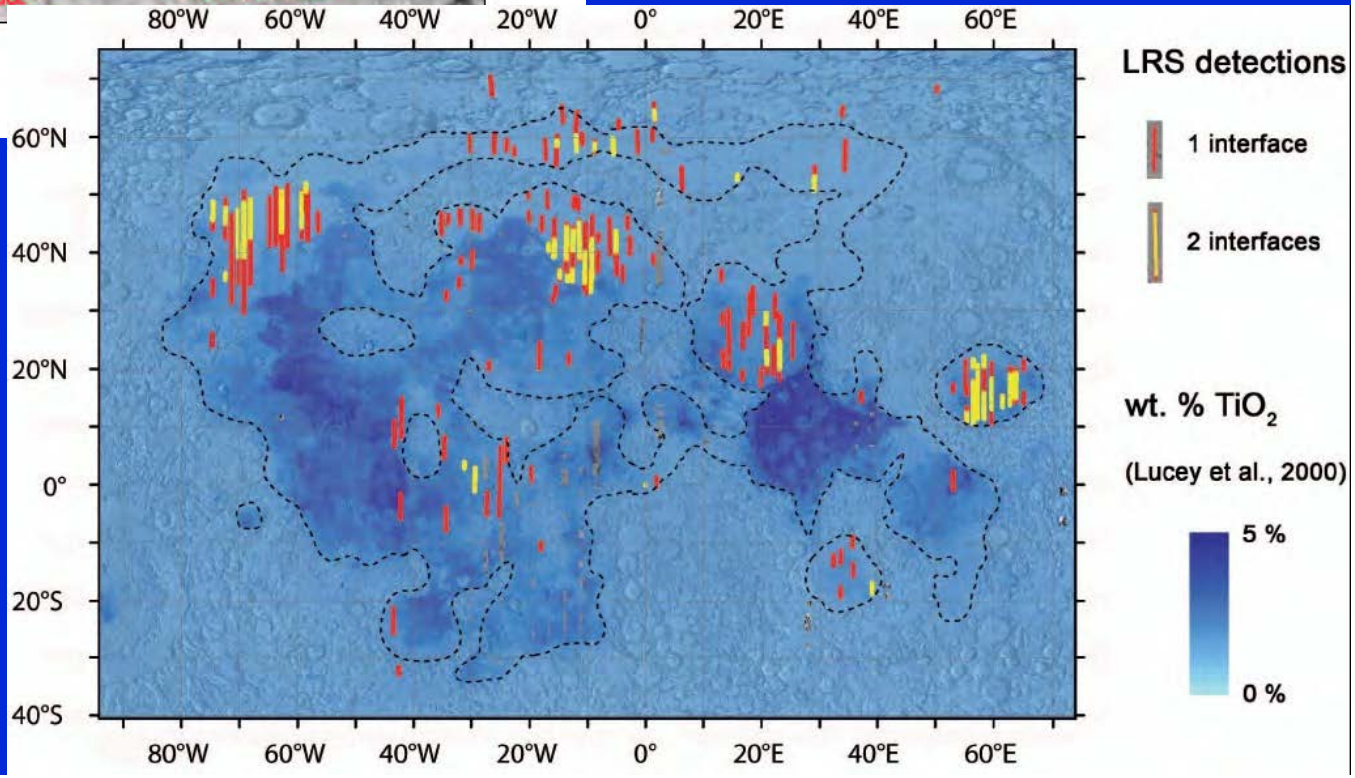
Oshigami et al., GRL 36, 2009, L18202.

Subsurface Interface detectability with TiO_2 content

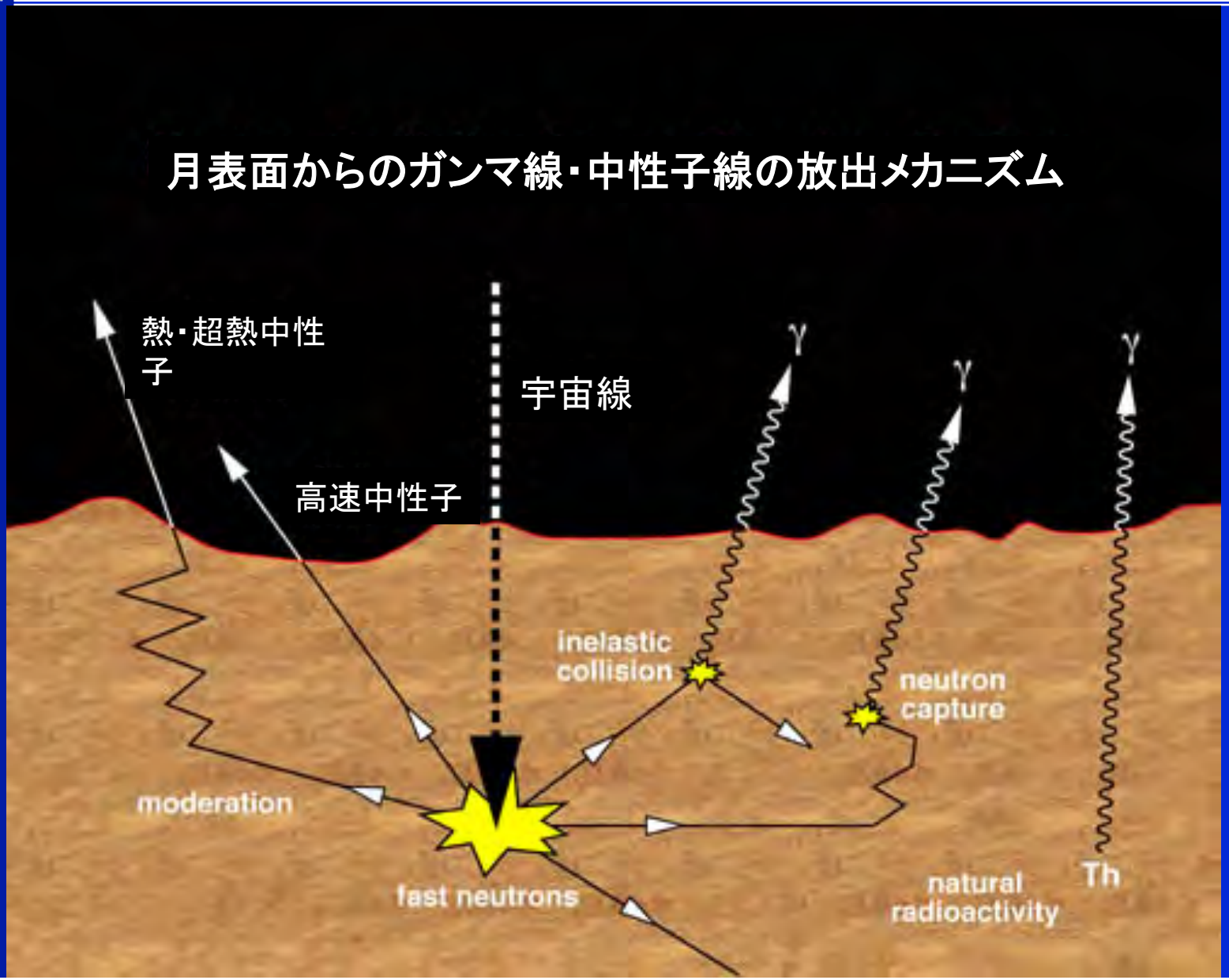


Pommerol et al., *GRL* **37**(2010), L03201

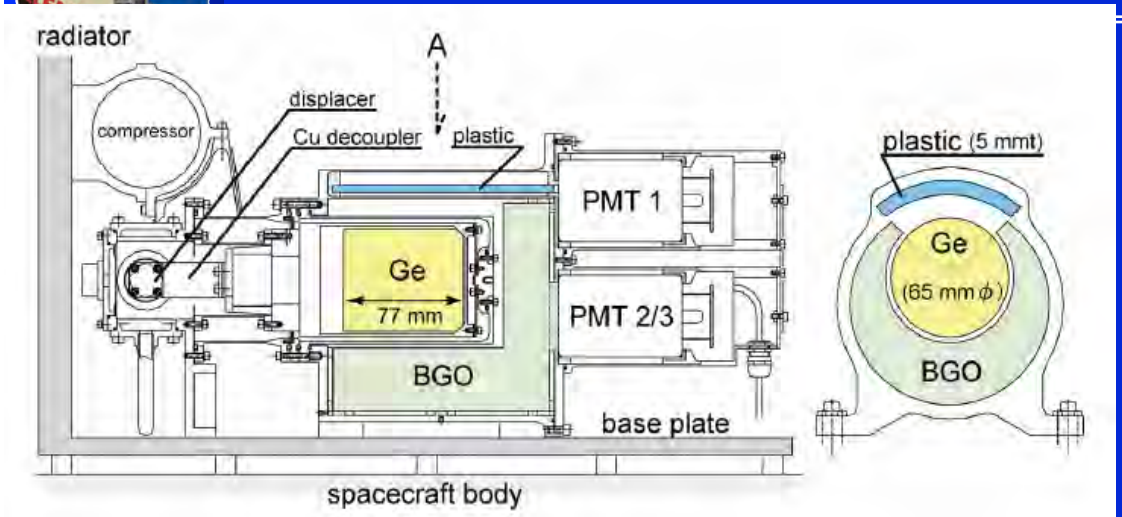
SELenological and E

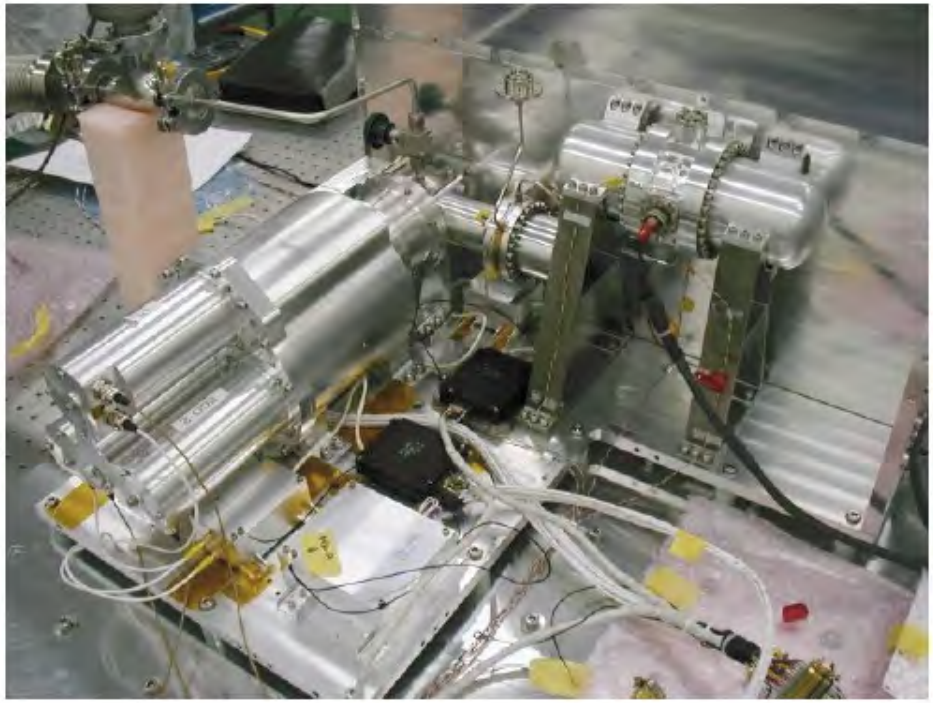


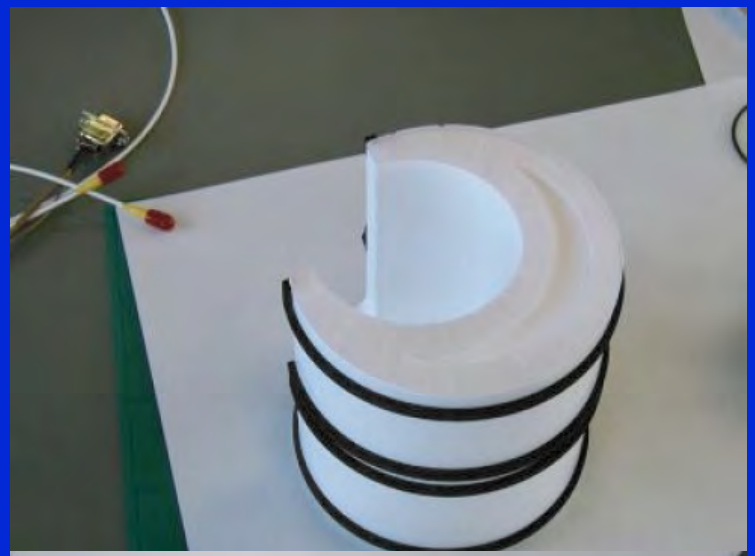
ガンマ線分光計GRSによる元素測定

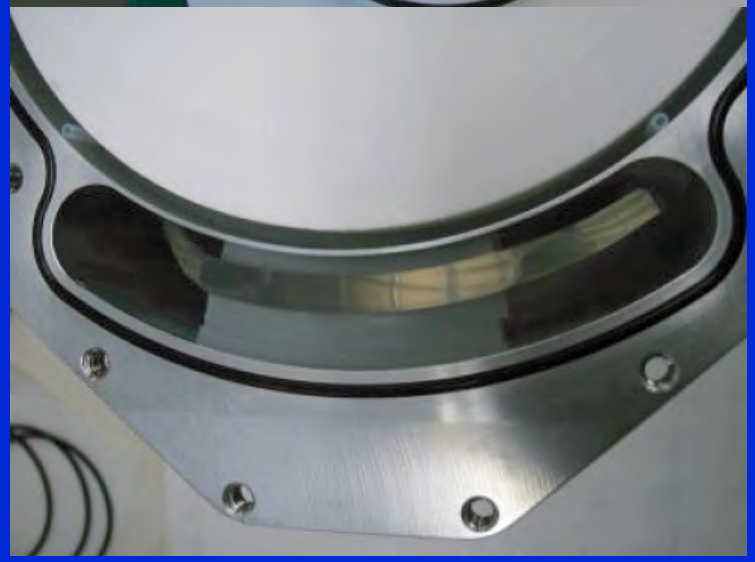


ガンマ線分光計GRSの構成



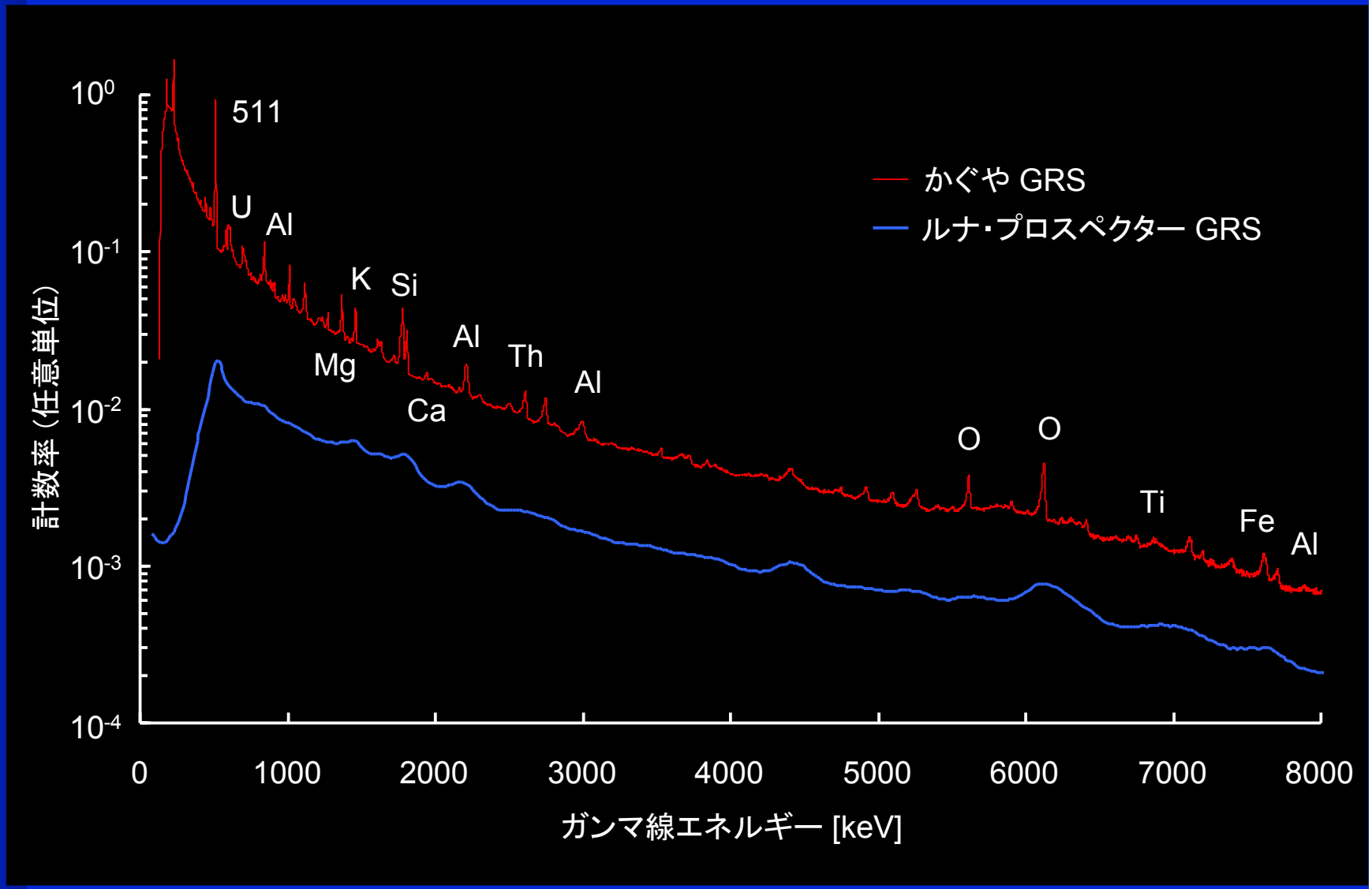






ガンマ線分光計による全球観測

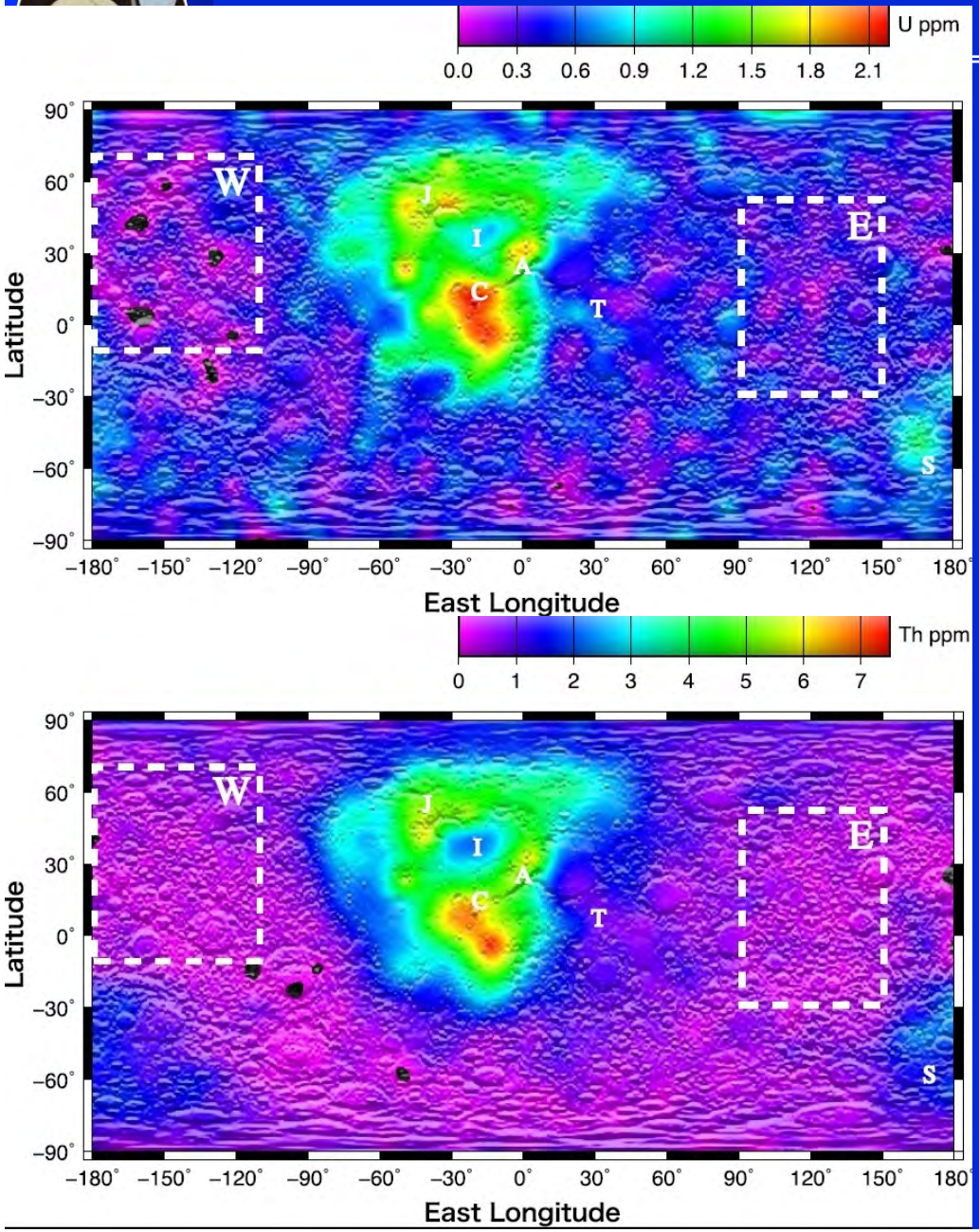
SELenological and ENgineering Explorer

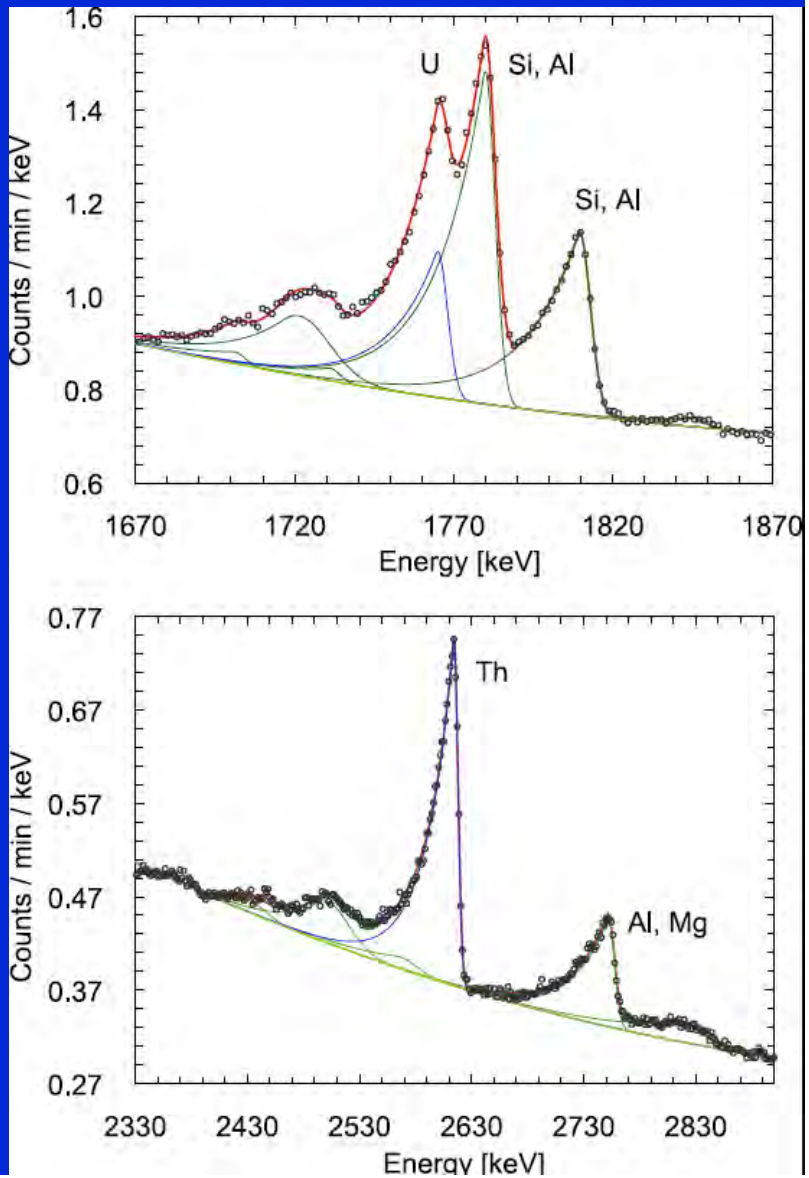


Hasebe et al., 2008

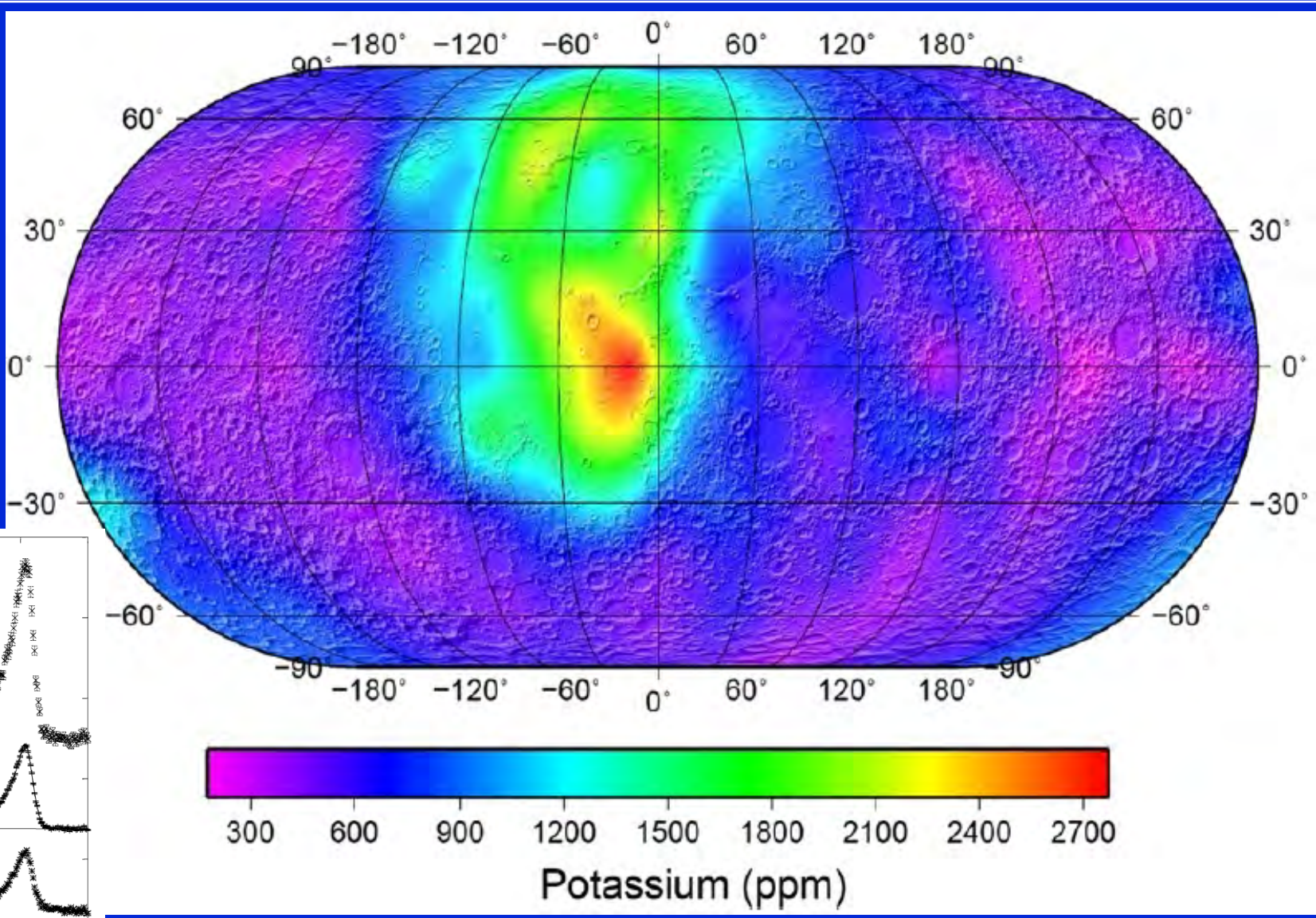
Uranium & Thorium distribution

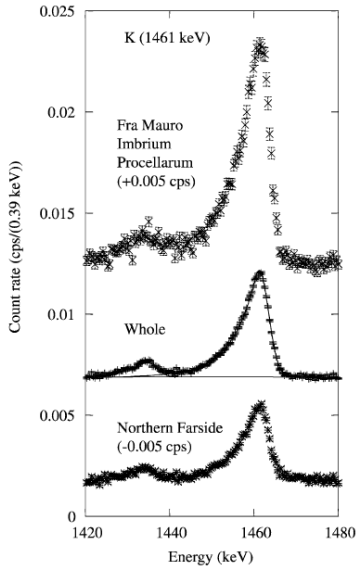
Yamashita et al., 2010





Potassium distribution



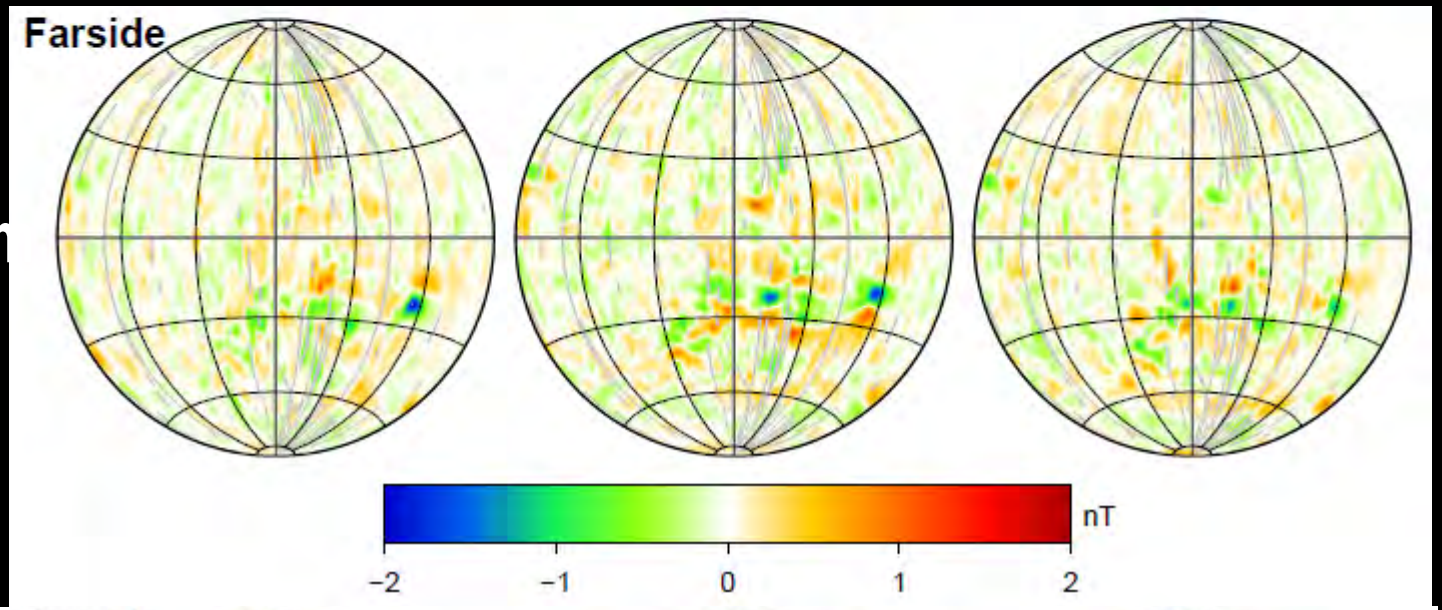


S. Kobayashi et al., SSR **154** (2010)

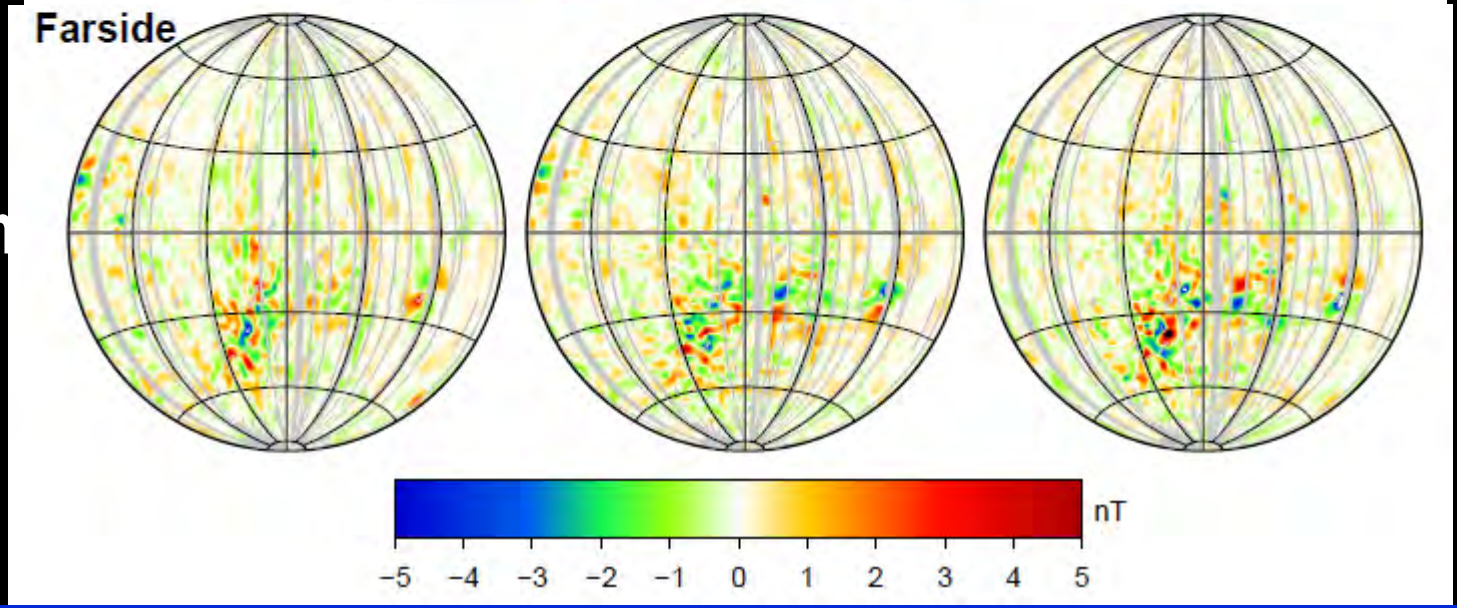
LMAG@100km vs LMAG@50km（Farside）

SELenological and ENgineering Explorer

@100km

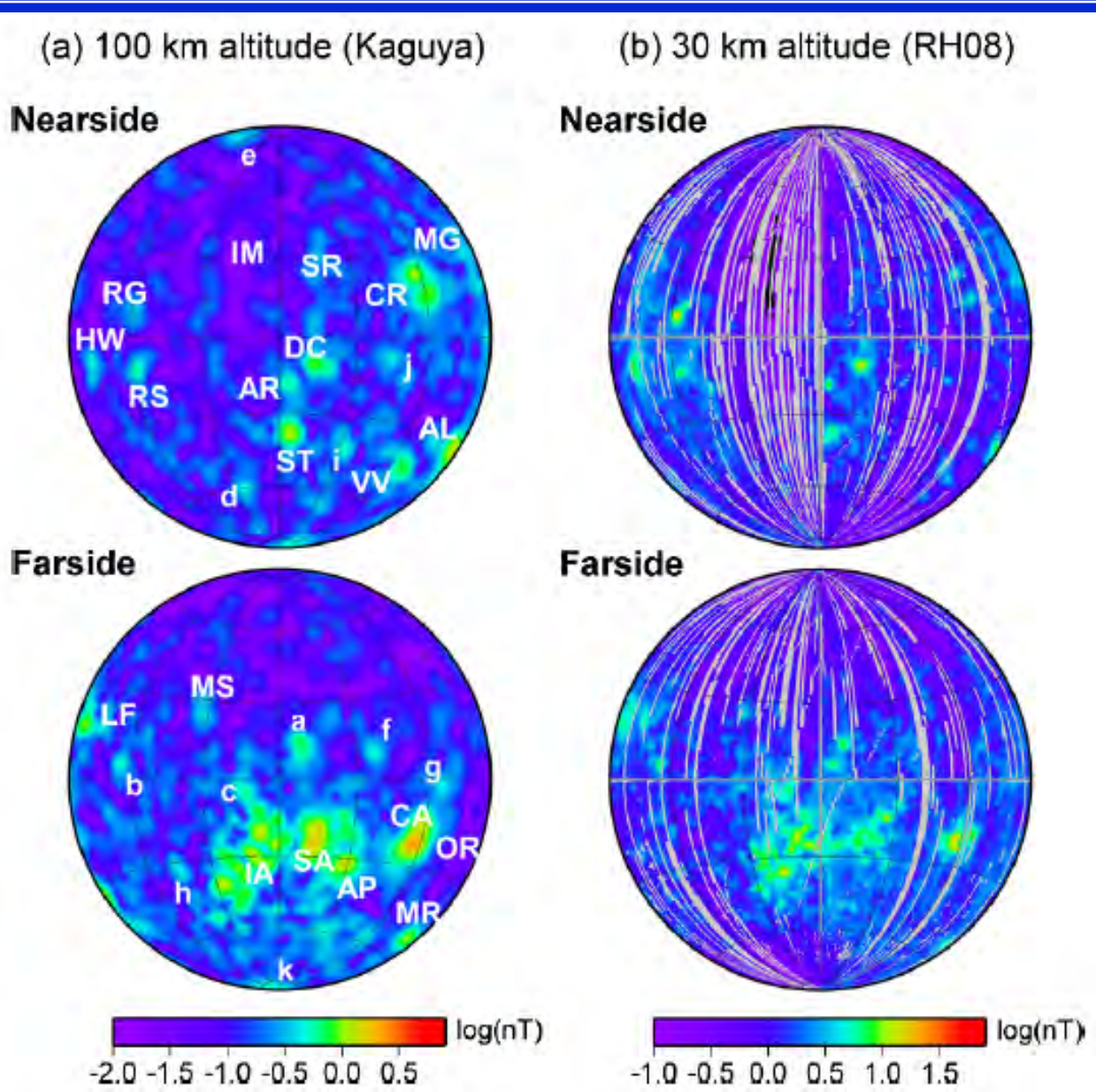


@50km



SELenological and ENgineering Explorer

Magnetic Anomaly by Kaguya LMAG

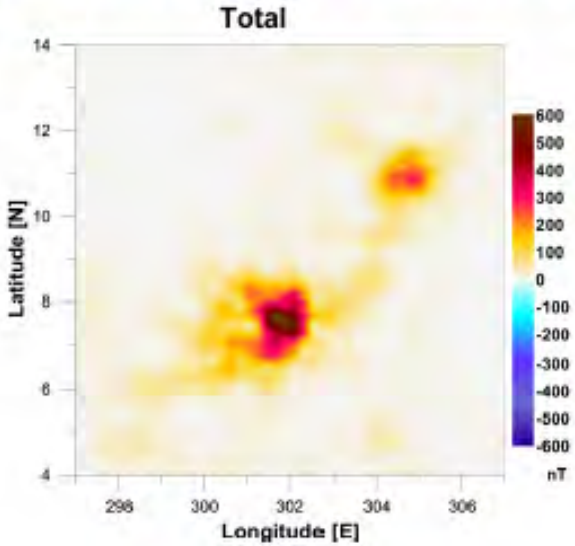


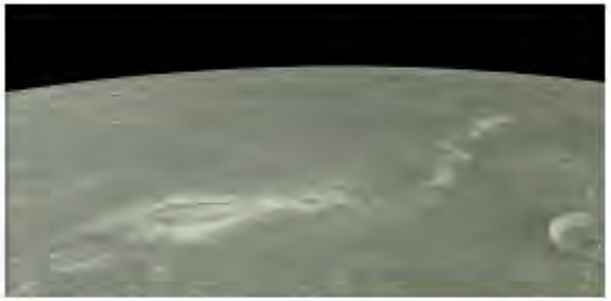
LP data (Richmond & Hood, 2008)

Tsunakawa et al., 2010

月磁気異常と高反射率地域の対比
月面上ミニ磁気圏による宇宙風化の回避(?)

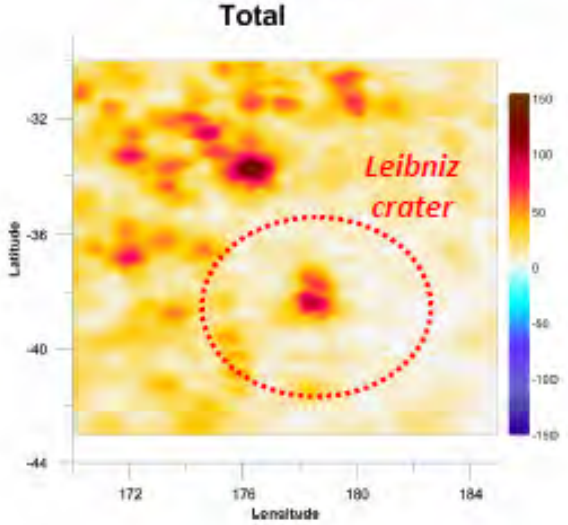
Reiner Gamma
LP
Alt. = 16.7 – 39.7 km
Max. of Btot = 663 nT

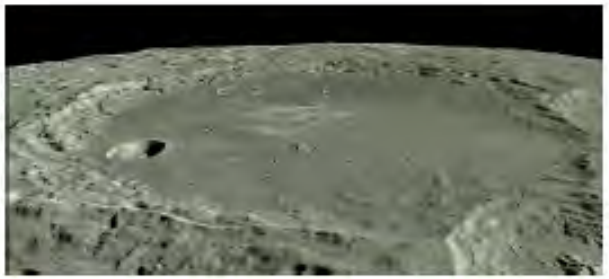




(Kaguya-HDTV)

Leibniz
LP
Alt. = 25.6 – 37.3 km
Max. of Btot = 100nT
(@ -5km)





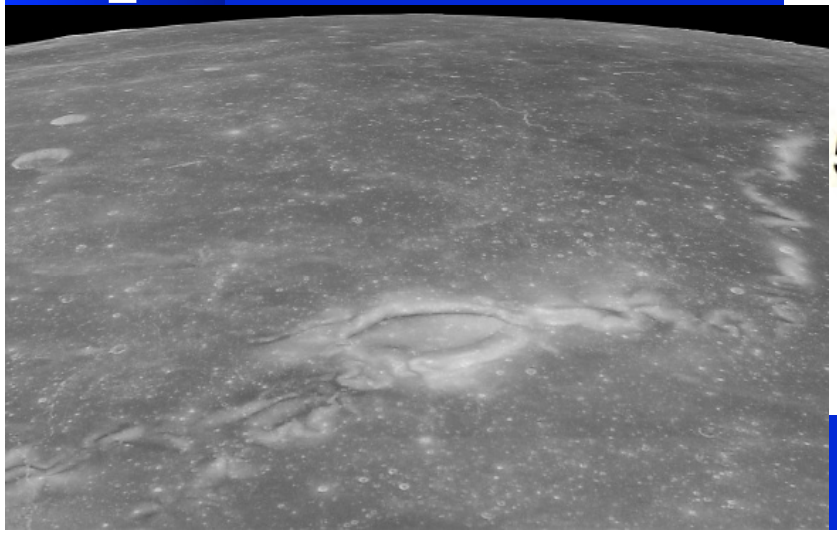
(Kaguya-HDTV)

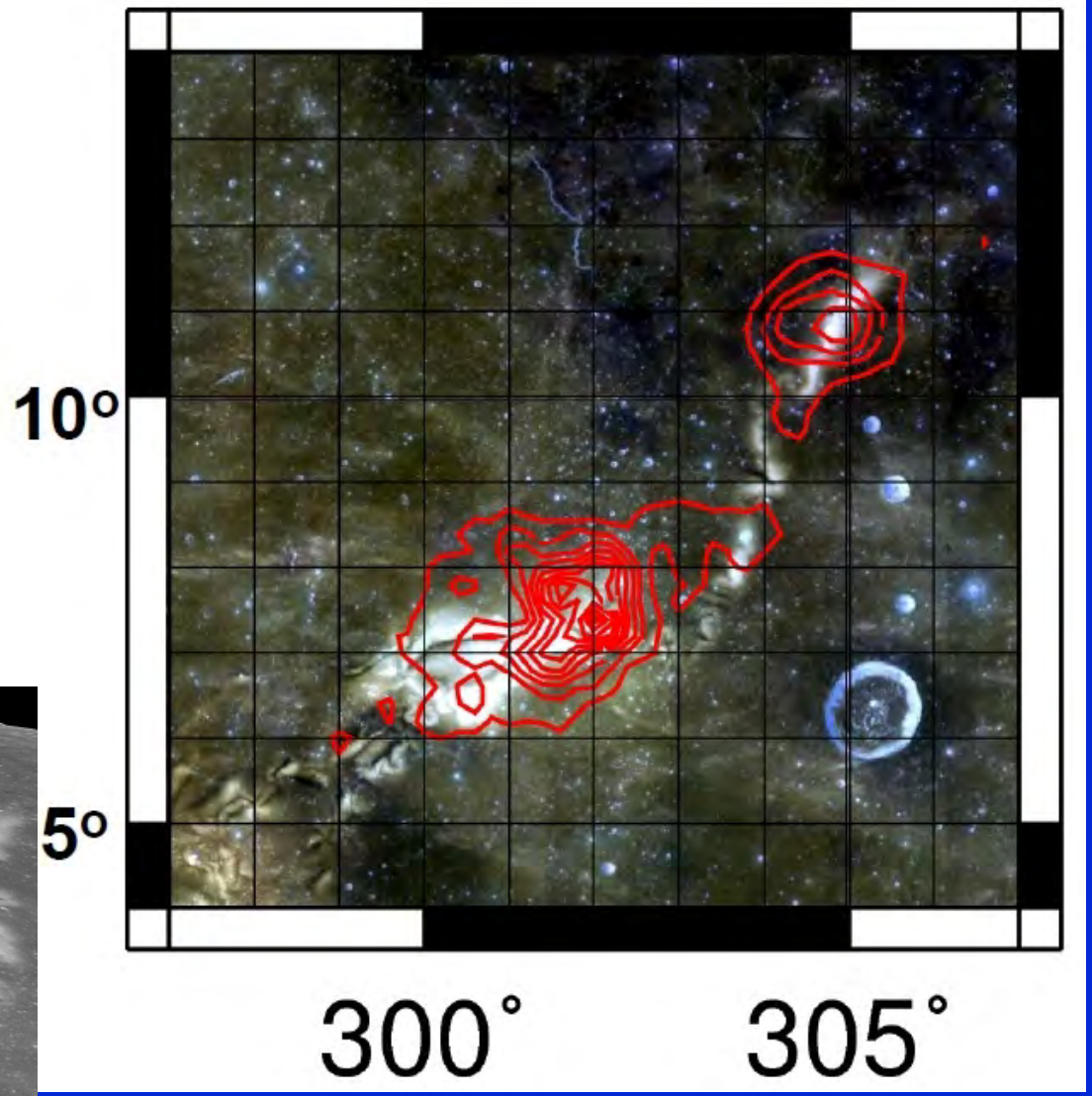
Magnetic Anomaly Research

nd ENgineering Explorer

Reiner- gamma

Max. 677nT@surface

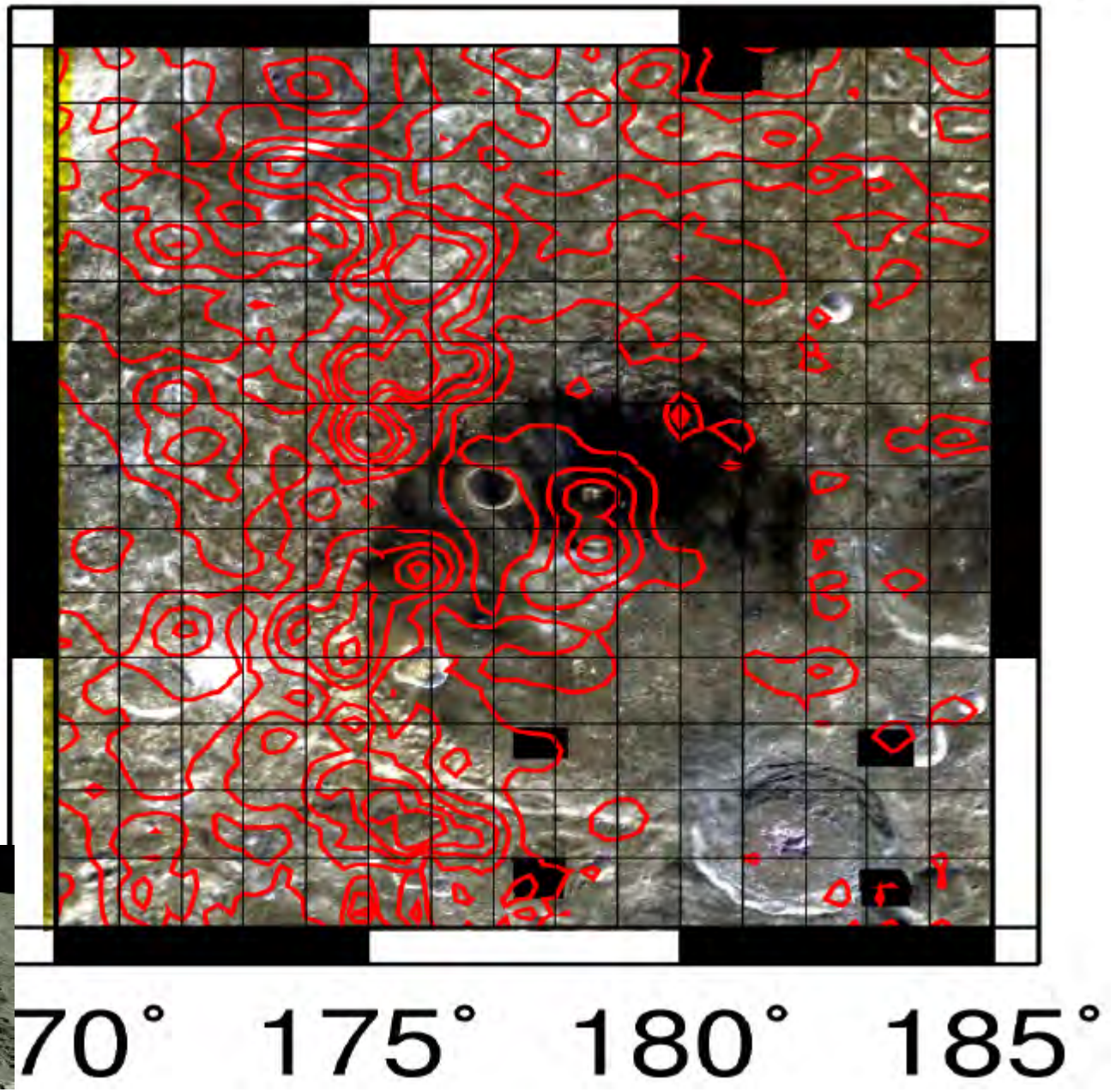




Tsunakawa et al., 2010

Leibnitz crater swirl

Max. 99.6 nT@surface

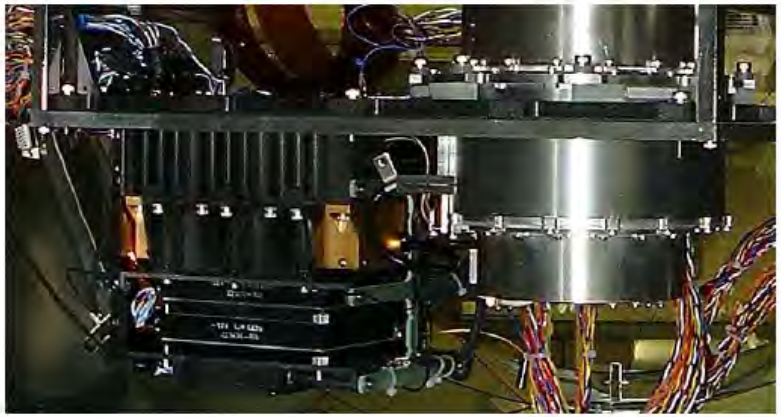


Plasma Experiments PACE 1. IMA

SELenological and ENgineering Explorer

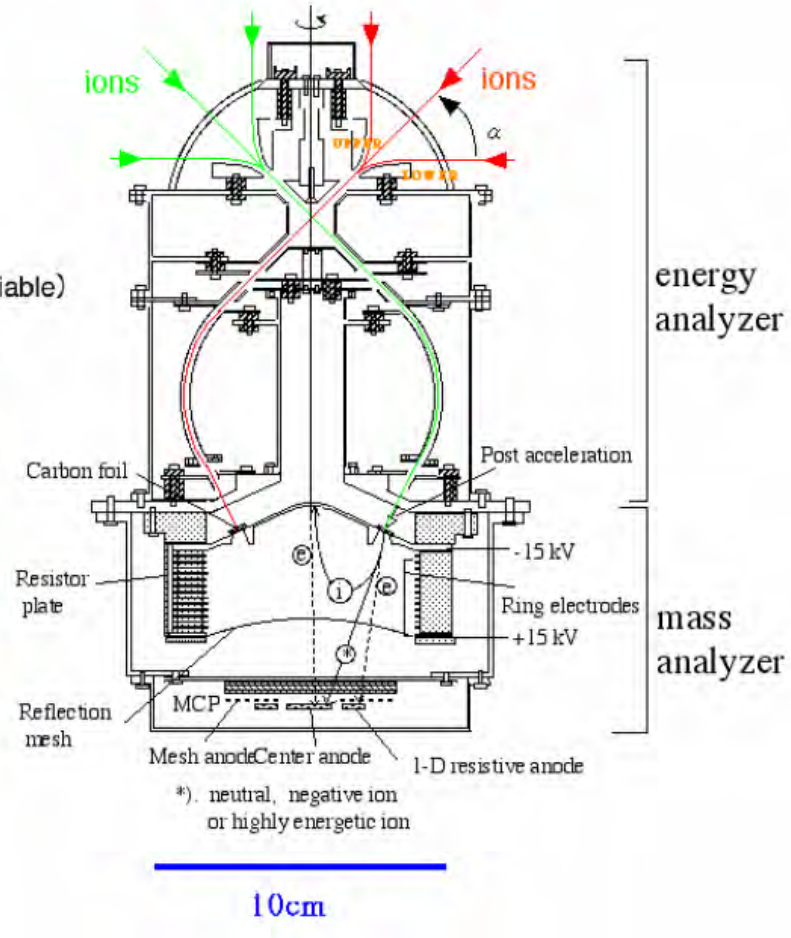
Specifications of IMA

Energy Range	5eV/q - 28keV/q
Mass Range	1 - 60
Energy Resolution	5% (FWHM)
Energy Sweep Step	32
Mass Resolution	m/Δm~15
Field of View	2π str.
Angular Resolution	5° × 10°(FWHM)
Time Resolution	1second
FOV Sweep Range	45° ± 45°
g-factor (5° ×22.5°)	10^{-6}~10^{-4} cm^2 str keV/keV (variable)



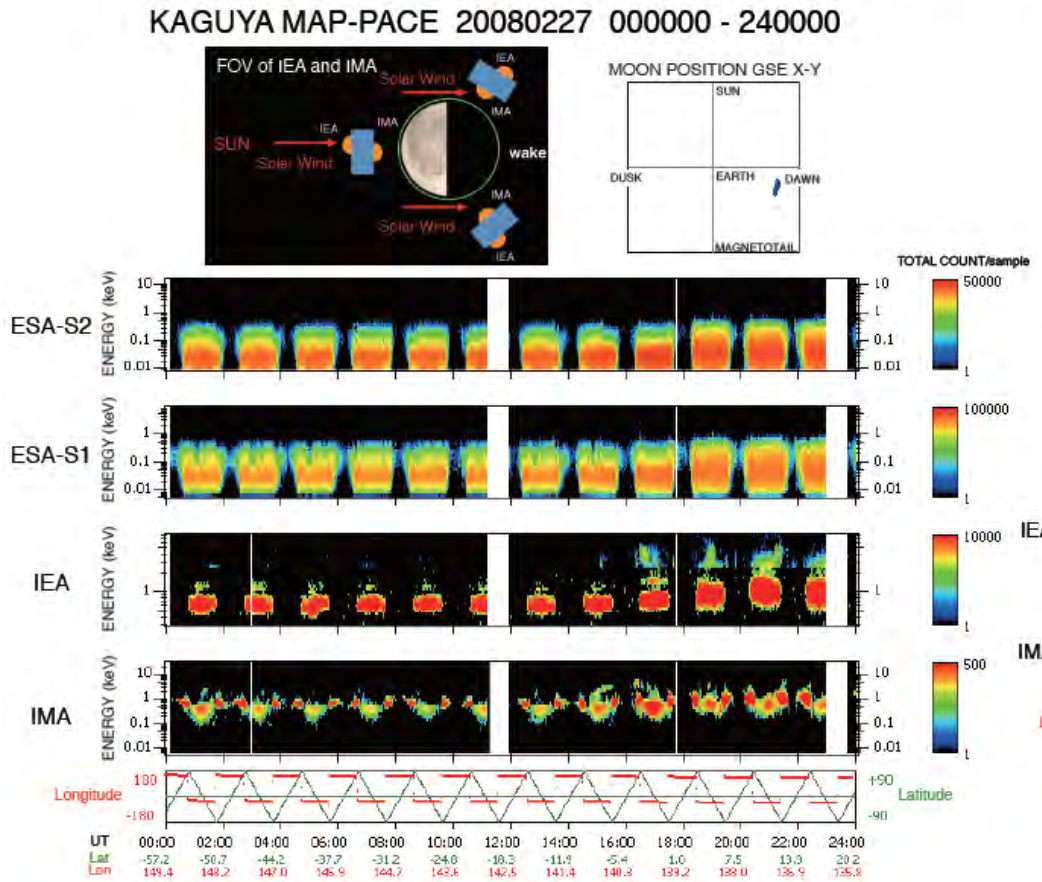
TOF Ion Energy Mass Spectrometer

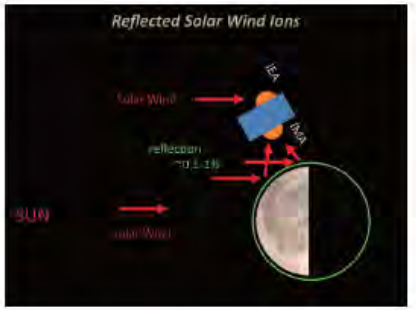
IMA-S

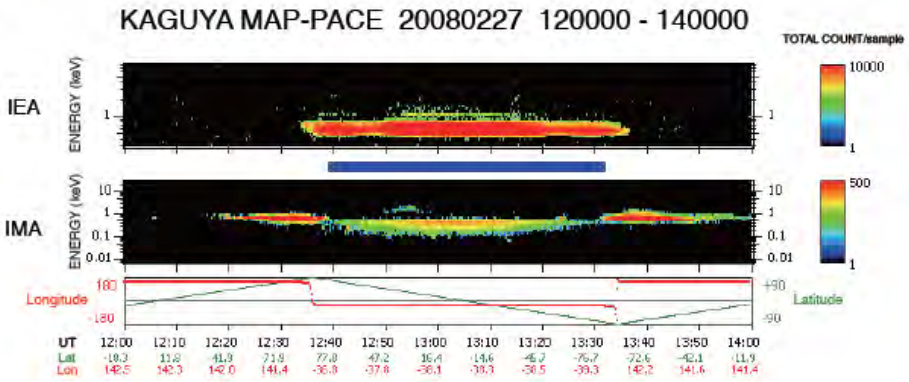


Solar Wind Observation of Plasma Instrument

Solar Wind Ion Reflection on the Lunar Surface



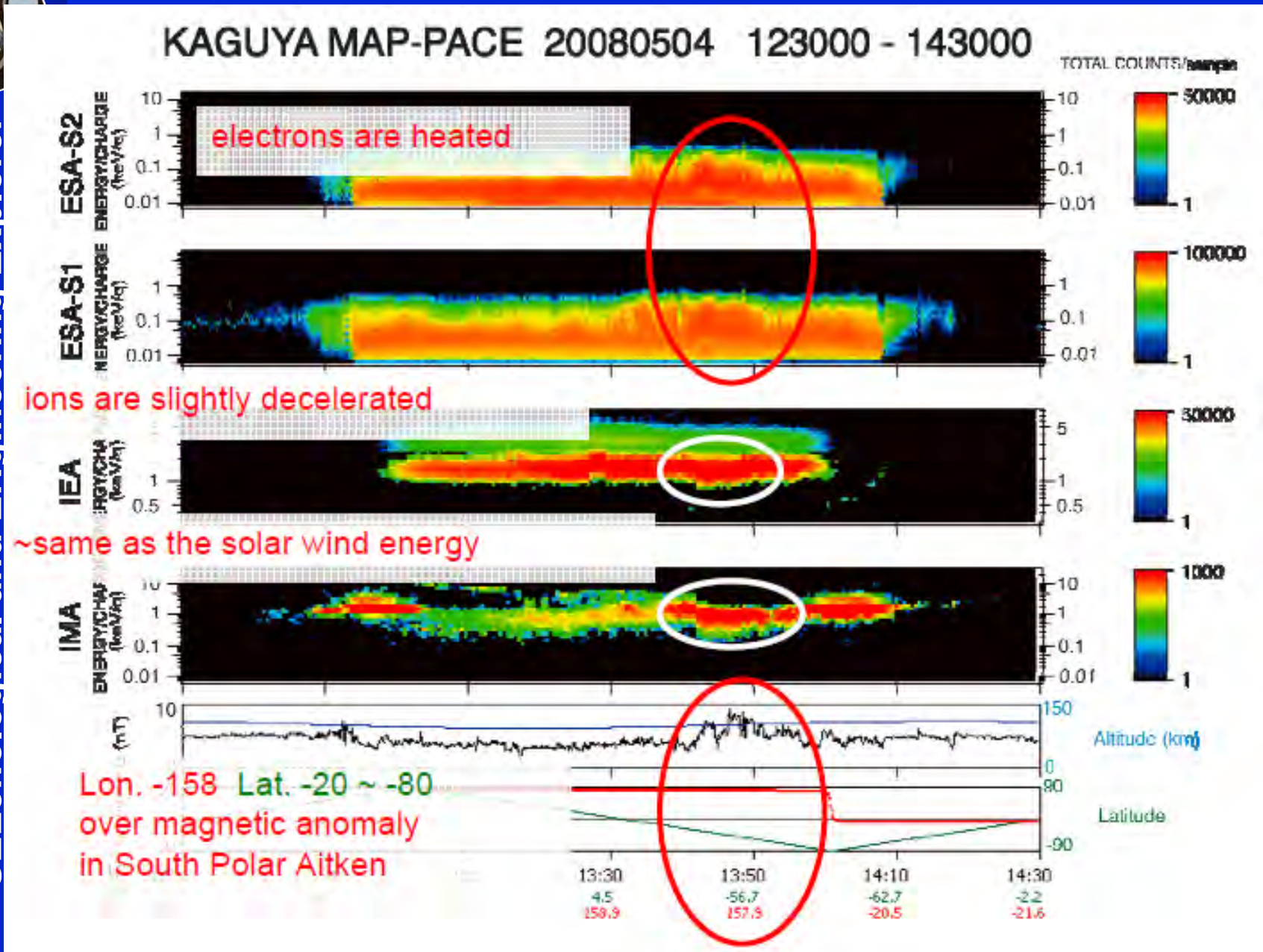




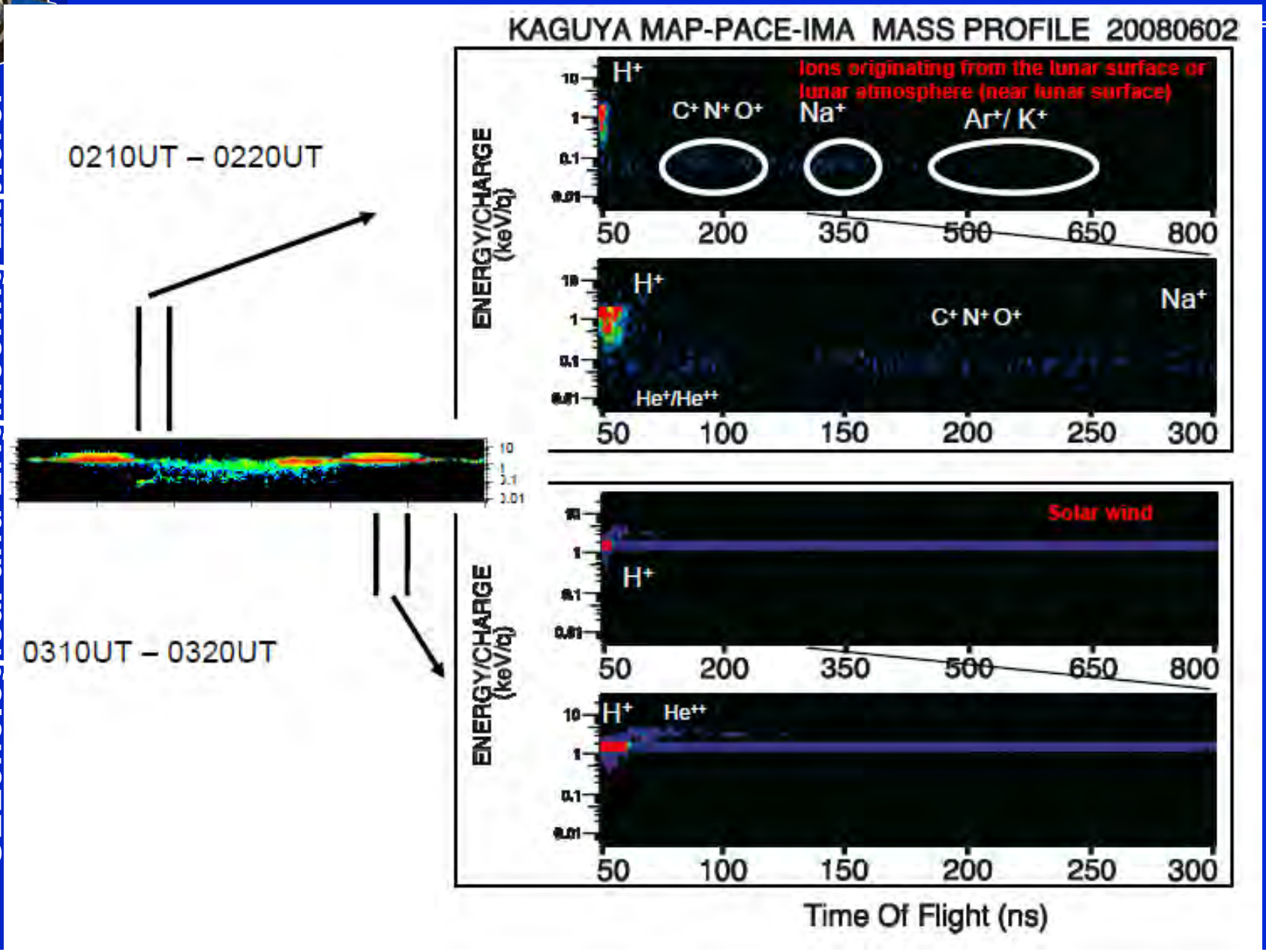
Saito et al., 2008

Solar Wind Reflection over magnetic anomaly

SELenological and ENgineering Explorer



Sputtering surface ions



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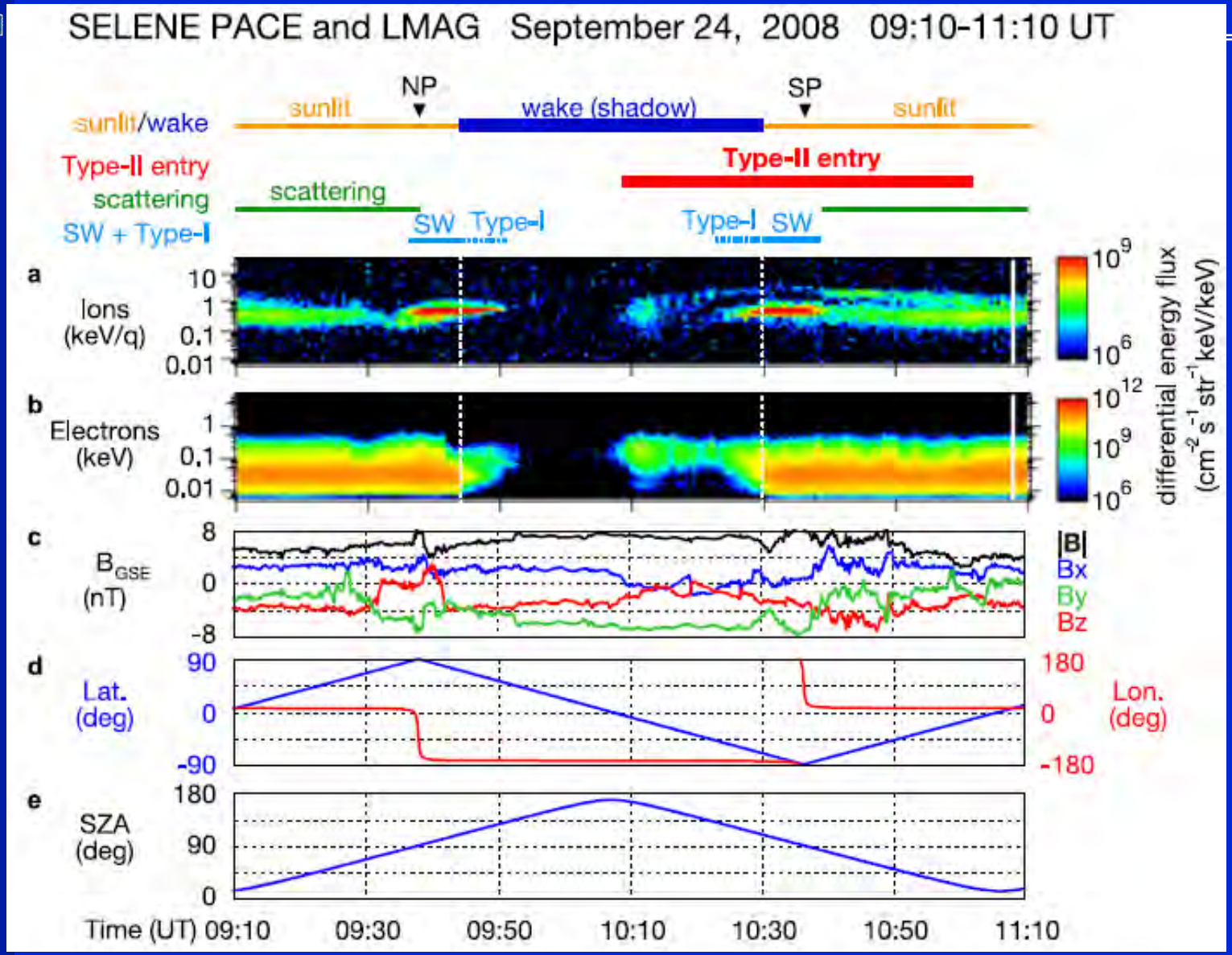
SW protons access into Moon wake



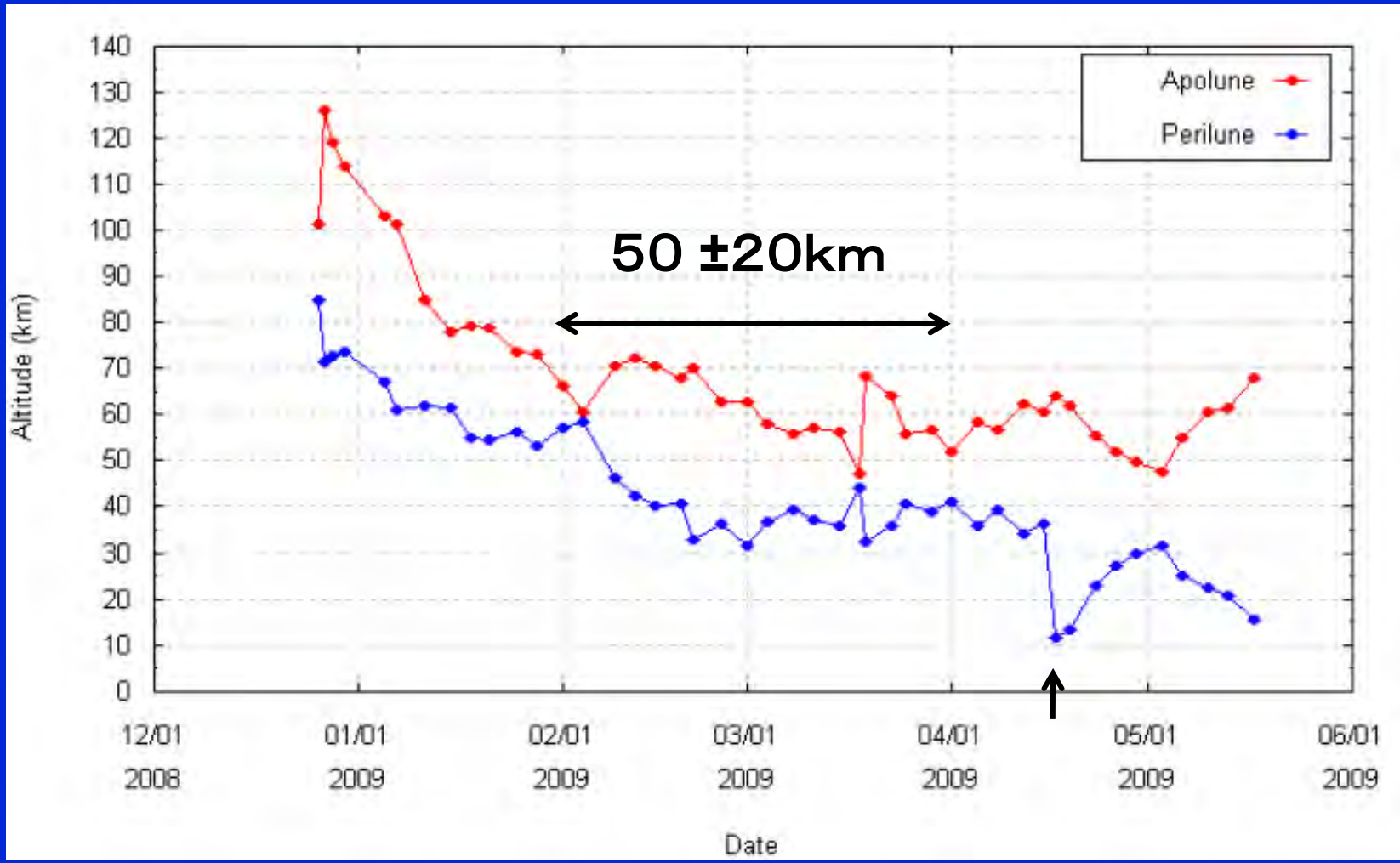
Nishino et al., *GRL* **36**(2009), L12108

SELenological and ENgineering Explorer

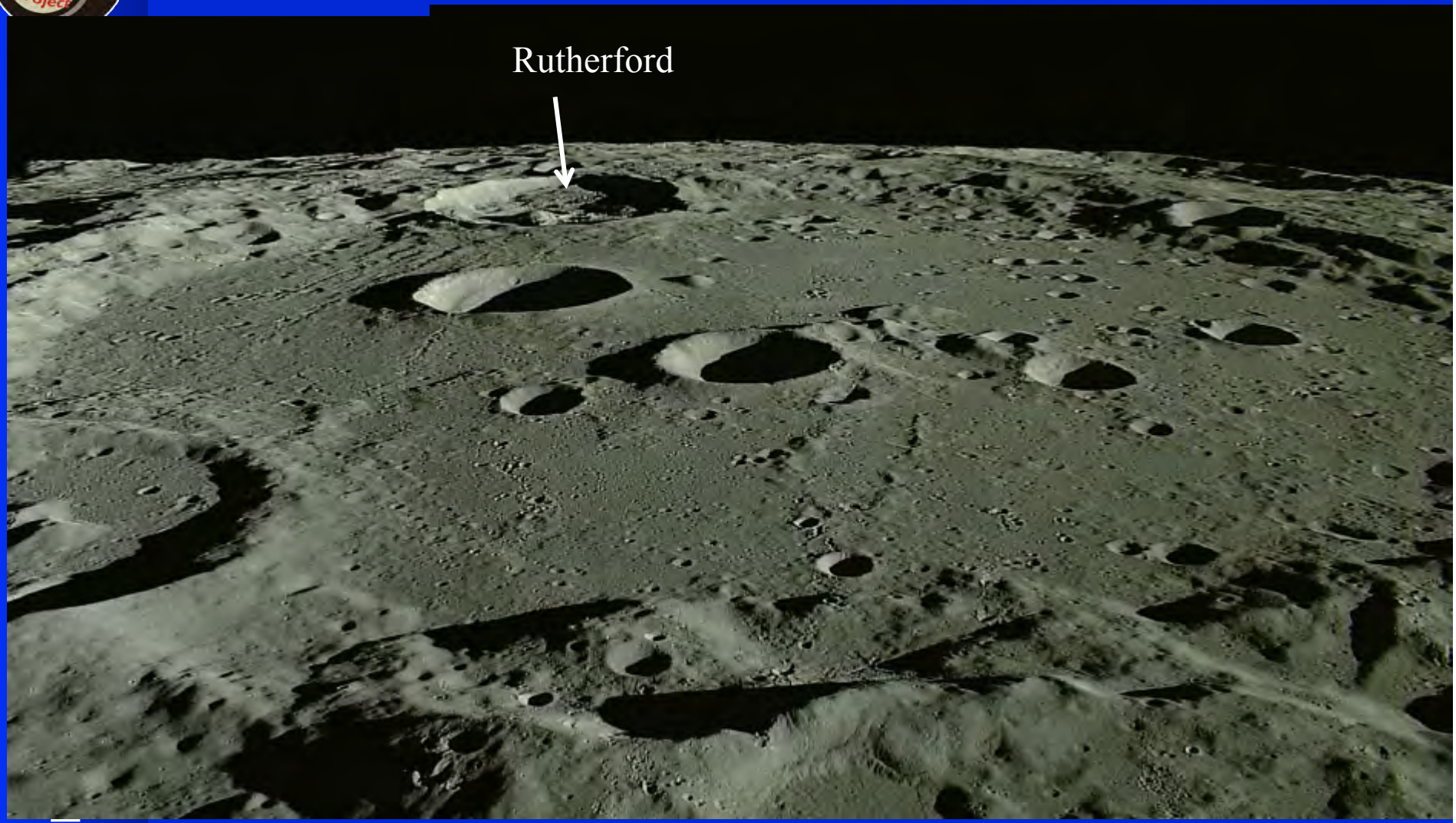
「かぐや」による発見

- 月裏側の重力異常 --- 二分性
- 月裏側の険しい地形 --- 二分性
- 南極、北極の地形 --- 日照率
- 裏側の火山活動　---　月の熱史
- 海の形成過程　---　月の熱史
- 広範囲な斜長岩の同定 --- マグマオーシャン仮説を支持
- ミニ磁気圏の発見　---　月のダイナモ
- 太陽風と月面の相互作用
- 全球表層物質の同定

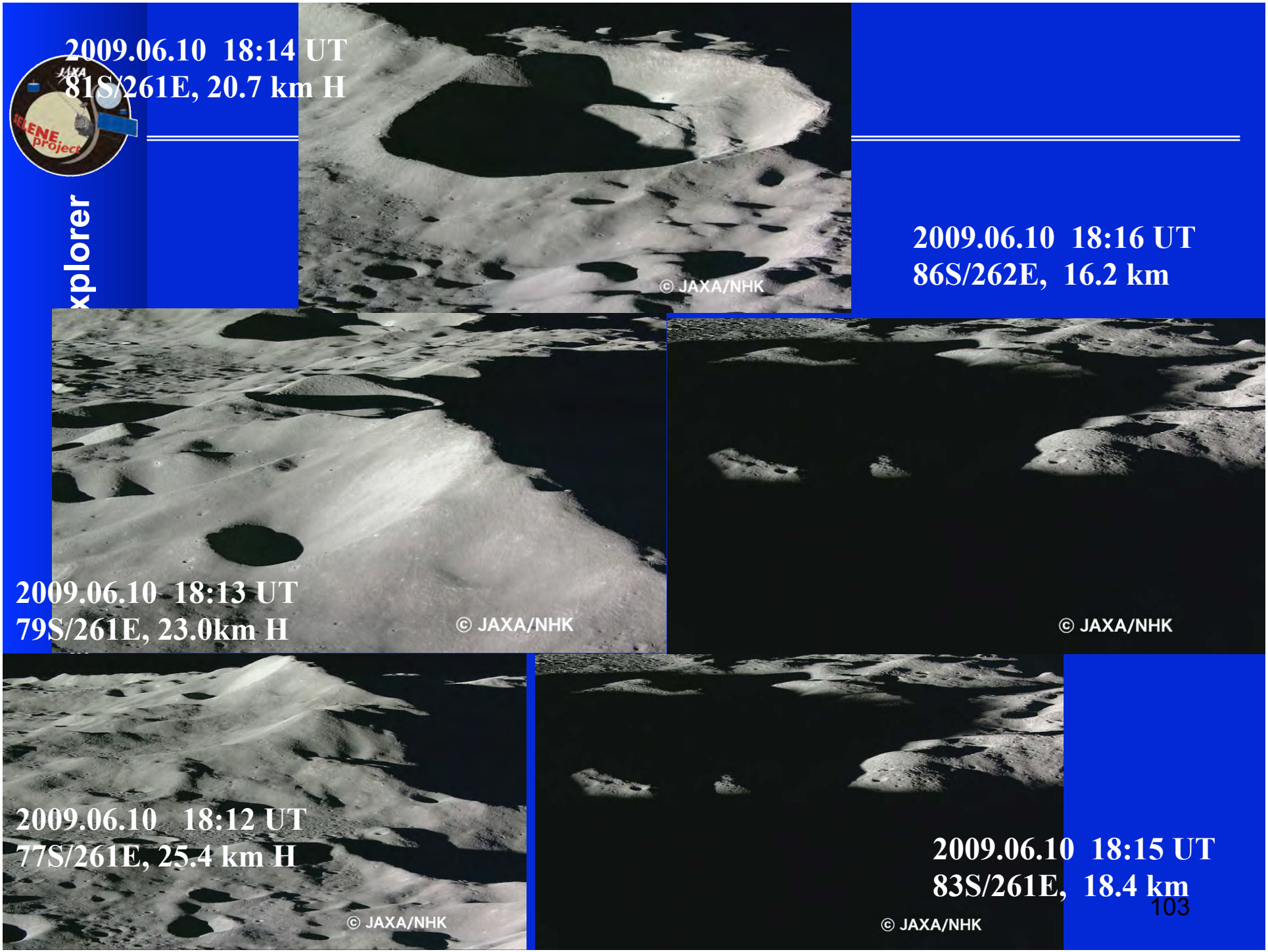
Altitudes in the extended mission phase



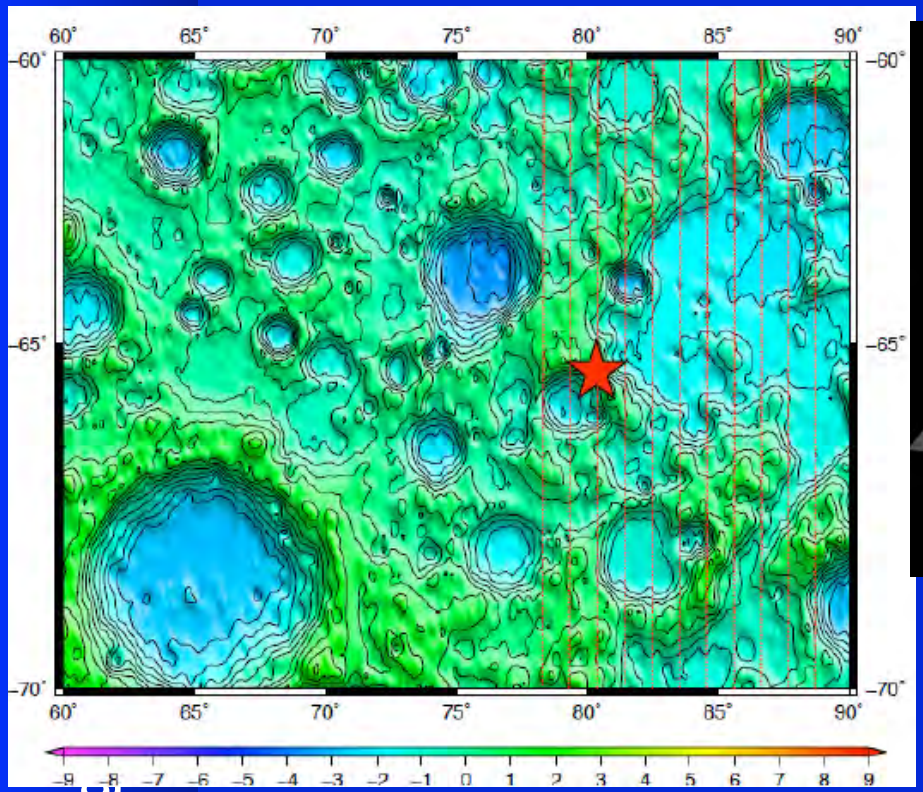
Low Altitude Images HDTV



Clavius Crater: 58.8S/14.1W, 245 km dia.


2009.06.10 18:14 UT
81S/261E, 20.7 km H
© JAXA/NHK
2009.06.10 18:16 UT
86S/262E, 16.2 km
2009.06.10 18:13 UT
79S/261E, 23.0km H
© JAXA/NHK
© JAXA/NHK
2009.06.10 18:12 UT
77S/261E, 25.4 km H
© JAXA/NHK
2009.06.10 18:15 UT
83S/261E, 18.4 km
© JAXA/NHK

Kaguya Impact on the Moon

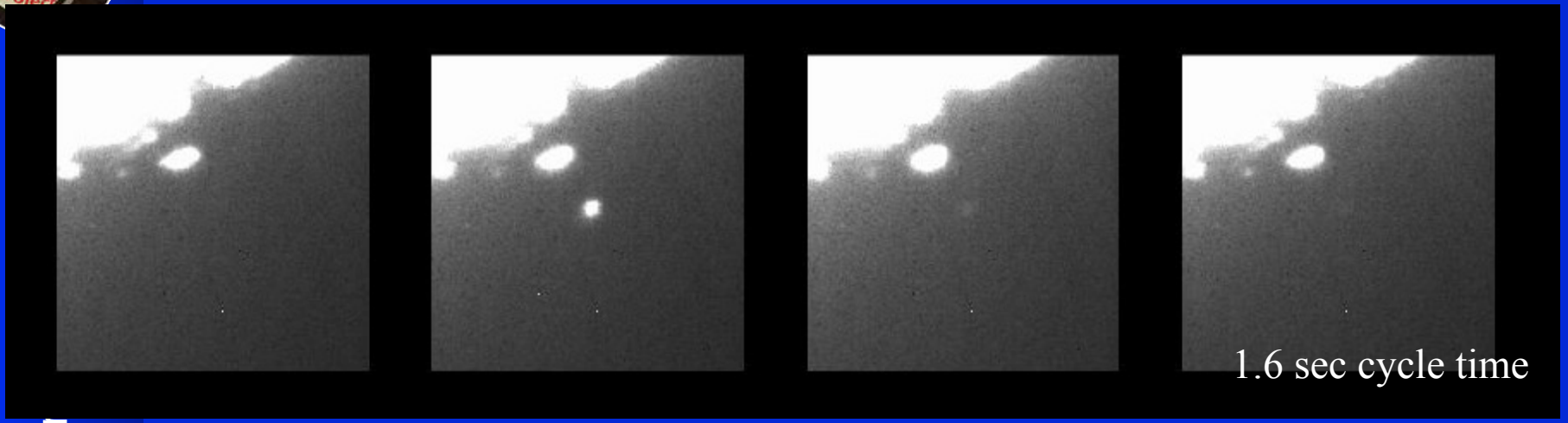


TC image of impact area

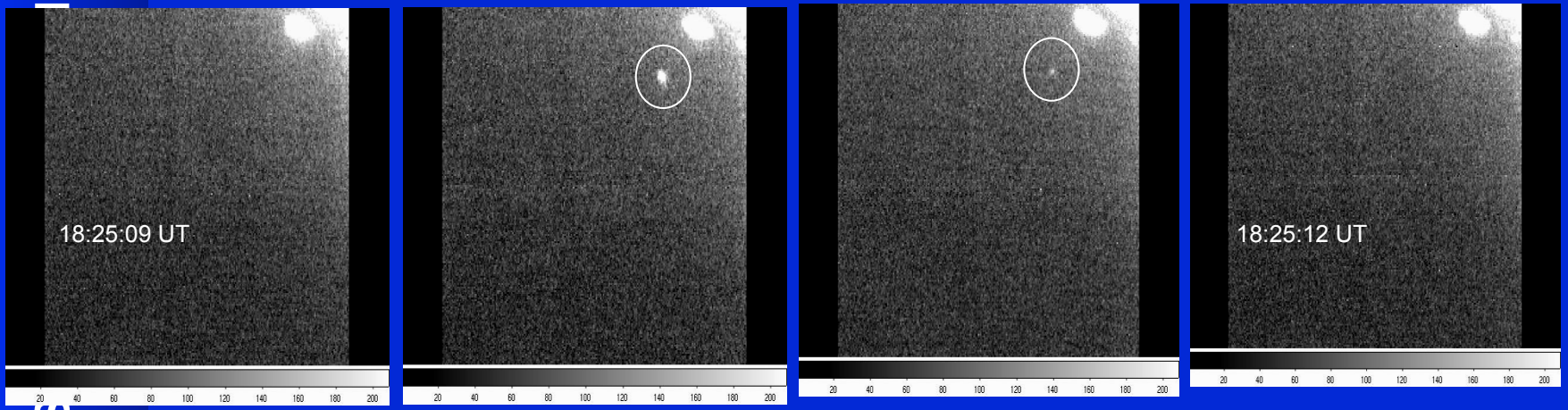
Impact Time: 09.06.10 T18:25:08.368
Impact point: 65.521S/80.418E

SELenolog

「かぐや」による衝突発光



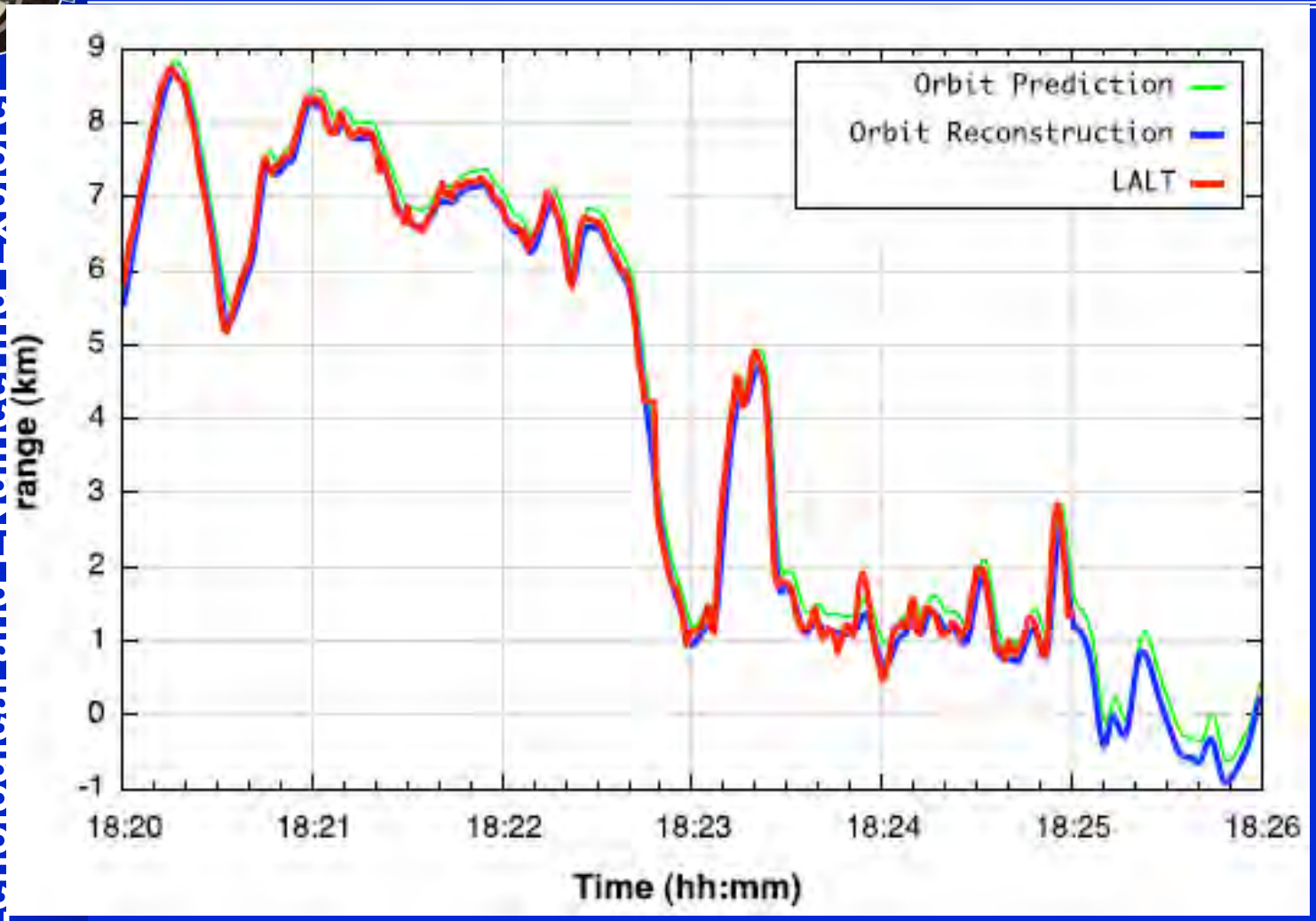
J. Bailey (UNSW) & S. Lee (AAO)
3.9m Anglo Australia Telescope, IRIS-2 Infrared Camera



Physical Research Lab, Mt. Abu observatory in India

LALT Range Data & Orbit Prediction

SELenological and ENgineering Explorer

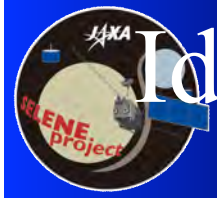


- before ⊿V
- after ⊿V
- LALT range

Final measurements at 2009-6-10T18:25:01.835

LALT range data: 1352.6 m

Orbital prediction: 1155.2 m

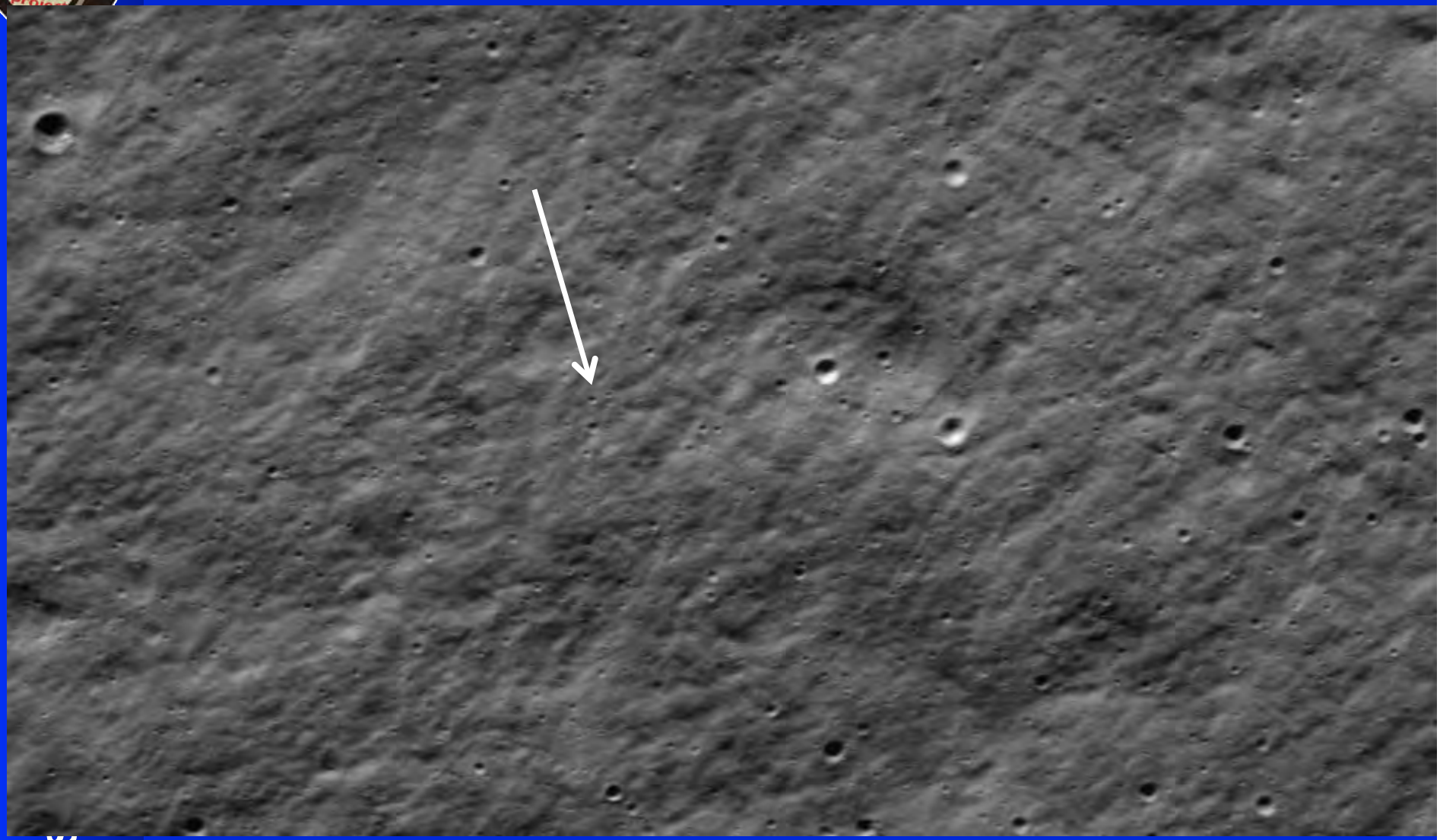


SELenological and ENgineering Explorer

Identification of Kaguya Impact Crater

- Kaguya impacted near Gill-B crater rim at 2009-6-10T18:25:08.386.
- Evidenced by termination of telecommunication signals, ground observations of impact flash
- Estimation of impact site and time using orbital estimation after deceleration deltaV and LALT topography data
- Press released the impact point 65.521S / 80.418E
- Impact crater search using LROC-NAC images

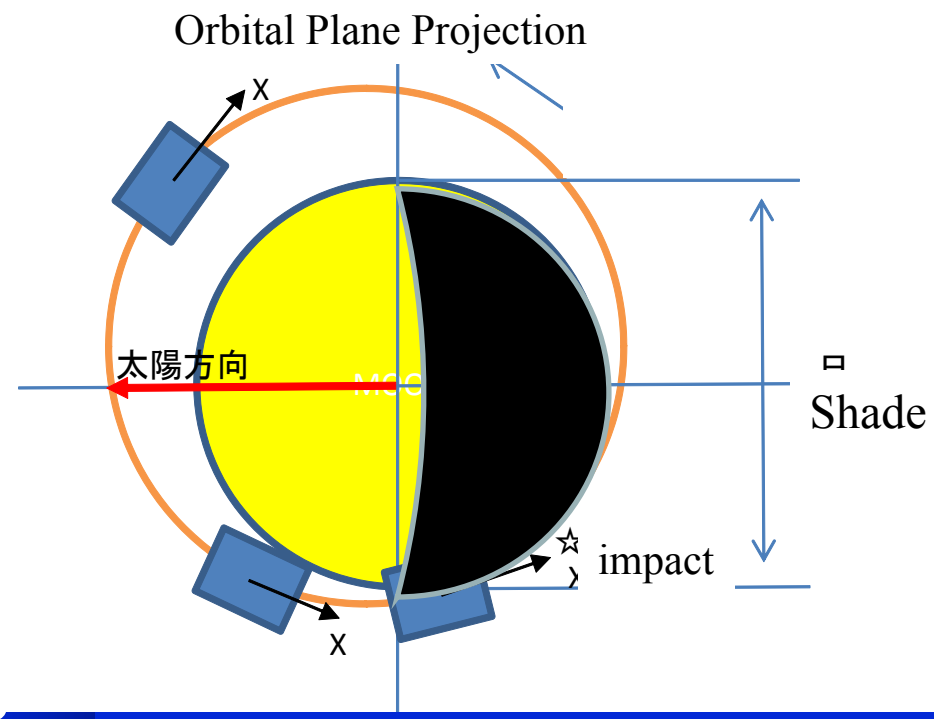
Press-released Kaguya I.S.

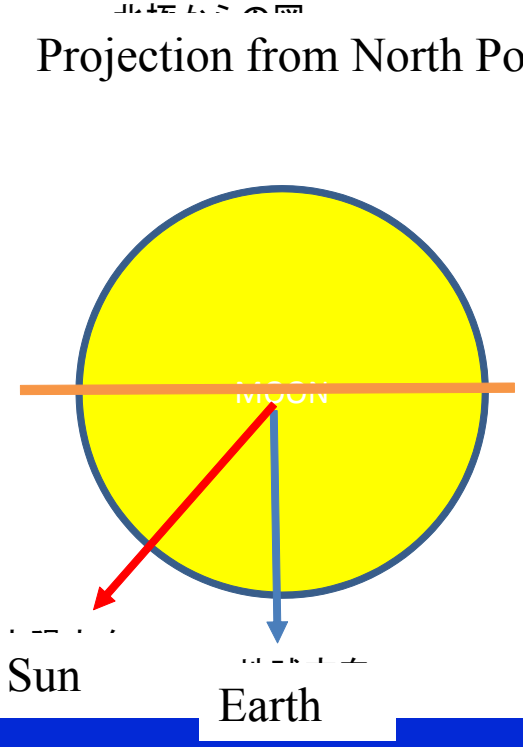


65.521S/ 80.418E

LROC/NAC M141751486R

Kaguya Maneuver for controlled infall





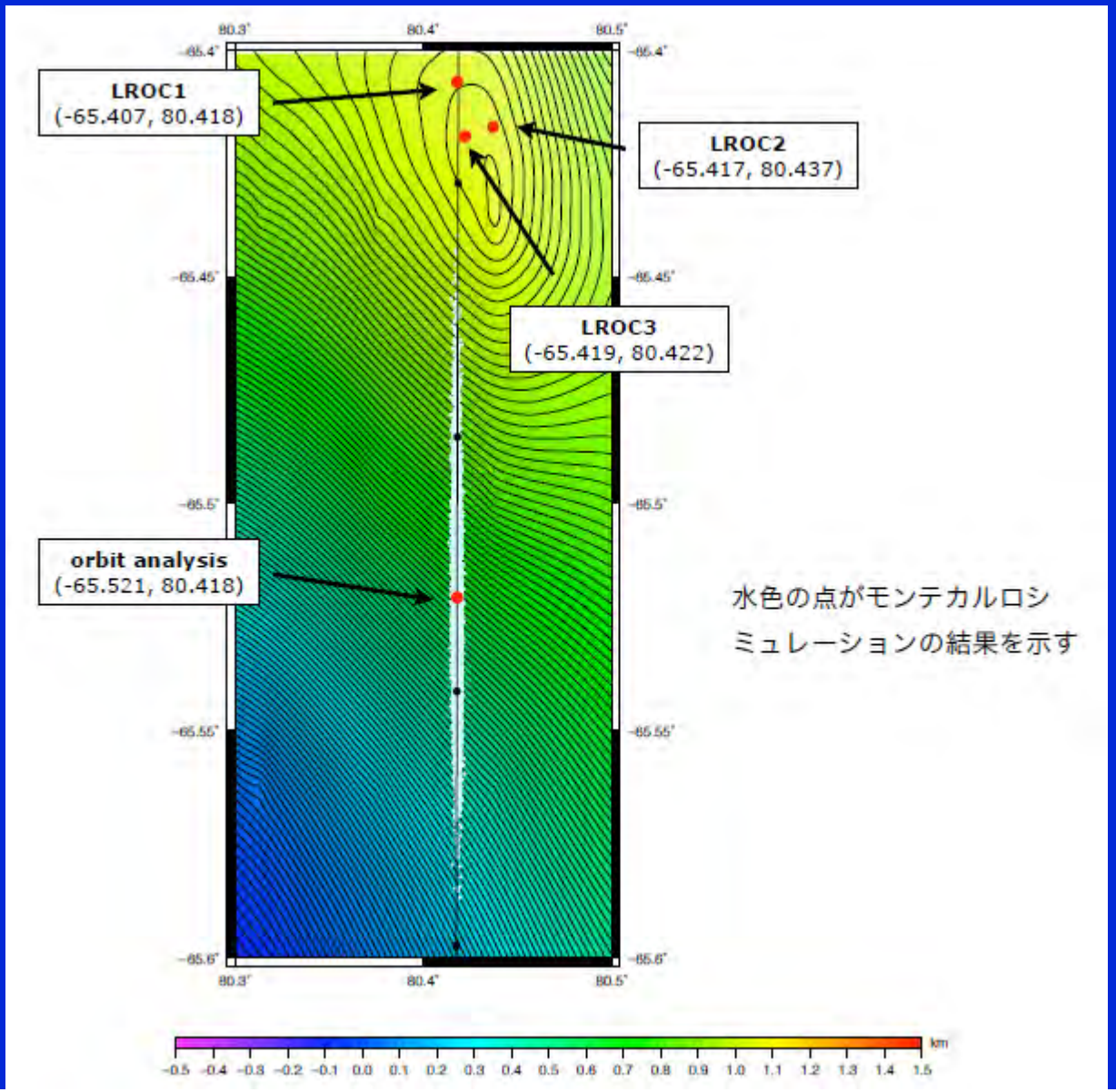
Kaguya Impact Crater

SELenological and ENgineering Explorer

Center of crater (65.407S / 80.418E)

LROC-NAC M141751486R

落下の許容範囲


LROC1
(-65.407, 80.418)
LROC2
(-65.417, 80.437)
LROC3
(-65.419, 80.422)
orbit analysis
(-65.521, 80.418)
水色の点がモンテカルロシミュレーションの結果を示す
80.3°
80.4°
80.5°
-65.4°
-65.45°
-65.5°
-65.55°
-65.6°
km
-0.5 -0.4 -0.3 -0.2 -0.1 0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5

2025年日本人宇宙飛行士月に立つ！！

SELenological and ENgineering Explorer