

## 木星ナトリウム雲に見るイオの火山活動

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### Jupiter's extended sodium nebula as an index of Io's volcanic activity

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Io, which has the innermost orbit among the Galilean moon, is the most volcanically active body in the Solar System. This volcanic atmosphere is ionized, becomes plasma and escapes into Jupiter's inner magnetosphere due to the interaction with Jupiter's co-rotating magnetic fields. This plasma forms a structure called Io plasma torus. This torus is mostly occupied by sulfur and oxygen ions, and most of these ions have emission lines at UV wavelengths. Although this is a minor constituent, the torus includes NaCl<sup>+</sup> ions that are originated in Io's volcanic gas. Pick-up of these NaCl<sup>+</sup> ions from Io's ionosphere and their subsequent destruction in the plasma torus produces fast flow of neutral sodium atoms, then Jupiter's sodium nebula is formed. The sodium

nebula has an extent of 1,000 Jupiter's radii. We have been making observations of this sodium nebula from the ground. The sodium nebula is showing variations in its sodium D-line brightness which are attributed variations in Io's volcanism. On the other hand, ground-based observations of Io's volcanic activity can be made by measuring thermal near infrared emissions from volcanic hotspot. In this presentation, comparison among data of Jupiter's sodium nebula, Io's volcanic infrared emissions and plasma emissions in the torus obtained by the Galileo spacecraft will be shown.