



## **The interaction between the Titan exosphere and the kronian magnetosphere : MIMI observations and modeling.**

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Titan's nitrogen-rich atmosphere is directly bombarded by energetic ions, due to its lack of a significant intrinsic magnetic field. Singly-charged energetic ions from Saturn's magnetosphere undergo charge exchange collisions with neutral atoms in Titan's exosphere, being transformed into energetic neutral atoms (ENAs). The Ion and Neutral Camera (INCA), one of the three sensors that comprise the Magnetosphere Imaging Instrument (MIMI) on the Cassini/Huygens mission to Saturn and Titan, images the ENA emissions from various ion/gas interaction regions in the Saturnian magnetosphere. During the Cassini's orbits around Saturn, the spacecraft performed several Titan flybys. INCA data acquired during these flybys confirm model predictions of dominant finite ion gyroradii effects, but also reveal a much more complex interaction. These observations are analyzed and compared to simulations. Loss mechanisms in the lower exosphere are also analysed, and a Titan exosphere model is proposed.