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Initial Results from the Miniature Imager for Neutral Ionospheric atoms and Magnetospheric Electrons (MINI-ME) on the FASTSAT Spacecraft

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The MINI-ME instrument is a collaborative effort between NASA's Goddard Space Flight Center (GSFC) and the U.S. Naval Academy, funded solely through GSFC Internal Research and Development (IRAD) awards. It detects neutral atoms from about 10 eV to about 700 eV (in 30 energy steps) in its current operating configuration with an approximately 10 degree by 360 degree field-of-view, divided into six sectors. The instrument was delivered on August 3, 2009 to Marshall Space Flight Center (MSFC) for integration with the FASTSAT-HSV01 small spacecraft bus developed by MSFC and a commercial partner, one of six Space Experiment Review Board (SERB) experiments on FASTSAT and one of three GSFC instruments (PISA and TTI being the other two). The FASTSAT spacecraft was launched on November 21, 2010 from Kodiak, Alaska on a Minotaur IV as a secondary payload and inserted into a 650 km, 72 degree inclination orbit, very nearly circular.

MINI-ME has been collecting science data, as spacecraft resources would permit, in "optimal science mode" since January 20, 2011. In this presentation, we report initial science results including the potential first observations of neutral molecular ionospheric outflow. At the time of this abstract, we have identified 15 possible molecular outflow events. All these events occur between about 65 and 82 degrees geomagnetic latitude and most map to the auroral oval. The MINI-ME results provide an excellent framework for interpretation of the MILENA data, two instruments almost identical to MINI-ME that will launch on the VISIONS suborbital mission (PI: Douglas Rowland).

Oral Requested

SM03: Dynamic Agents of Magnetosphere-Ionosphere Coupling