

## **THE AERONOMY OF ICE IN THE MESOSPHERE MISSION: SCIENCE RESULTS AFTER FOUR PMC SEASONS**

JAMES M. RUSSELL III 1, Scott M. Bailey 2, Mark E. Hervig 3, Cora Randall 4, Larry L. Gordley 3 and the AIM Science Team

1. Center for Atmospheric Sciences Hampton University Hampton VA,  
email: james.russell@hamptonu.edu
2. Bradley Department of Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA, email: baileys@vt.edu
3. GATS Inc., Newport News, VA, email: l.l.gordley@gats-inc.com
4. Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder  
email: randall@lasp.colorado.edu

The Aeronomy of Ice in the Mesosphere (AIM) mission was launched from Vandenberg Air Force Base in California at 1:26:03 PDT on April 25, 2007 becoming the first satellite mission dedicated to the study of noctilucent clouds. A Pegasus XL rocket launched the satellite into a near perfect 600 km, noon, sun synchronous circular orbit. AIM carries three instruments - a nadir imager, a solar occultation instrument and an in-situ cosmic dust detector. This paper will provide a brief mission overview, instrument descriptions and scientific findings. Results from the first two years of AIM observations show that the NLC season turns on and off like a “geophysical light bulb” transitioning at the season start from no clouds to 100% occurrence frequency in days and vice versa at the season end. Data show that temperature change is a dominant factor in controlling season onset, variability during the season and season end. Rising water vapor levels at the beginning and falling values at the end also play a key role in season initiation and cessation. Structures seen in the clouds look very much like complex features seen in tropospheric clouds including large regions of near circular ice voids. This paper will also describe the first satellite observations of cosmic smoke input to the atmosphere measured by the SOFIE instrument. AIM is approved to operate through September 30, 2012.

NLCs, water vapor, temperature

JAMES M. RUSSELL III, Center for Atmospheric Sciences, Hampton University, 23 Tyler Street, Hampton, VA 23668, tel: 757-728-6893, fax: 757-727-5090, email: [james.russell@hamptonu.edu](mailto:james.russell@hamptonu.edu)