**C2H4 mole fraction and temperature profiles after the 2010 Saturn Storm**

**Brief description of data set**

The Composite Infrared Spectrometer (CIRS) aboard the Cassini spacecraft acquired thermal infrared spectra of Saturn’s stratosphere before, during, and after the Great Storm of 2010-11. Measurements of CH4 and H2 were used to retrieve temperature profiles inside the storm region. Not only did the storm perturb the troposphere, it also heated the stratosphere at distinct longitudes known as beacons. Temperatures at the 2-millibar (mbar) level increased from 140K before the storm, to 160K at the beginning of this study in March 2011, to 196K in July 2011, and then relaxed to 184K by April 2012. Increased temperatures permitted the study of trace species that were near the limit of detectability before the storm. Ethylene (C2H4) is formed from photolysis of CH4 at microbar levels in Saturn’s atmosphere and it flows down to the millibar level to which CIRS is sensitive. Using temperature information derived from CH4, the abundance of C2H4 was retrieved at the 1.3-mbar level where mole fractions ranged from 1 ppb to 50 ppb.

The temperature and abundance data span the period from 2011-03-03 to 2012-04-16 on the following dates: 2011-062, 2011-188, 2011-199, 212-013, 2012-014, 2012-047 and 2012-107. Temperatures are tabulated over the pressure range from 4001 to 0.0004 millibars although the CIRS data are sensitive only to roughly 400 to 100 mbars in the troposphere and 8 to 0.1 mbars in the stratosphere. Ethylene mole fractions are reported for the latter range (8 to 0.1 mbars).