Geophysical Research Abstracts
Vol. 14, EGU2012-11974, 2012
EGU General Assembly 2012

Multi-fluid MHD study of the solar wind interaction with Venus at Solar max and Solar min conditions

Y. Ma (1), A.F. Nagy (2), C.T. Russell (1), D. Najib (2), and G. Toth (2)
(1) IGPP, UCLA, United States, (2) AOSS, University of Michigan, United States

We study solar wind interaction with Venus using a new advanced multi-fluid MHD model that has recently been developed. The model is similar to the numerical model that was successfully applied to Mars (Najib et al., 2011). Mass densities, velocities and pressures of the protons and major ionosphere ion species (O^+, O_2^+ and CO_2^+) are self-consistently calculated by solvng the individual coupled continuity, momentum and energy equations. The various chemical reactions and ion-neutral collision processes are considered in the model. The simulation domain covers the region from 100 km altitude above the surface up to 16 R_V in the tail. An adaptive spherical grid structure is constructed with radial resolution of about 10 km in the lower ionosphere. The model is applied to both solar-maximum and solar-minimum conditions and model results are compared in detail with multi-species single fluid model results and observations.