

## The interaction between the solar wind and subsolar ionosphere of Venus during IMF turning : Reconnection above the ionosphere

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We have developed a two-dimensional MHD model of the Venus ionosphere-solar wind interaction with chemical reactions included to investigate the response of the Venus ionosphere to the change of IMF. Venus has no significant intrinsic magnetic field, hence no magnetosphere, indicating that the solar wind directly interacts with the planetary ionosphere. In situ measurements by the Pioneer Venus Orbiter (PVO) reported large-scale magnetic field in the ionosphere, which would be induced by the solar wind, when solar wind dynamic pressure is higher than the ionospheric thermal pressure. The orientation of the large-scale magnetic field reflects the IMF orientation. The generation mechanism of this field structure is well explained by the diffusion/convection model [e.g., Shinagawa et al., 1987].

Despite the success in reproducing the observed magnetic field structure by MHD studies, most of them were restricted to quasi-steady cases, where IMF orientation was assumed to be constant. Actual orientation of IMF is changing all the time. For the cases with IMF change, dynamical processes are expected to operate. For example, PVO observations reported that the ejection rate of ionospheric plasma clouds enhances. Destruction of the large-scale magnetic field belt after the decrease in solar wind dynamic pressure is regarded as one of the possible mechanisms to produce magnetic flux ropes in the ionosphere. The Kelvin-Helmholtz instability at the ionopause and/or gravity waves at the bottom of the ionosphere may be responsible for generation of the flux ropes. But the generation mechanisms of both the plasma clouds and the flux ropes are still mysteries. They can be associated with a change in IMF orientation. The results of our two-dimensional simulations suggest that magnetic field line reconnection occurs just above the Venus ionopause during IMF turning. We will present the results and discuss possibility of the magnetic field line reconnection also in the subsolar ionosphere of Venus.