Kelvin-Helmholtz instability at the Venus ionopause

Naoki Terada[1], Shinobu Machida[2], Hiroyuki Shinagawa[3]

[1] STE Lab., Nagoya Univ., [2] Dept. of Geophys., Kyoto Univ., [3] STEL, Nagoya Univ.

http://www-step.kugi.kyoto-u.ac.jp/~teradan/

A two-dimensional global hybrid model of the solar wind-Venus ionosphere interaction is used to investigate the Kelvin-Helmholtz (K-H) instability at the Venus ionopause. We have found that the development of the K-H mode exhibits a clear asymmetry between hemispheres of upward and downward solar wind convection electric fields. While the K-H mode develops from the subsolar location in the upward electric field hemisphere, it develops only in a limited region between 40 and 90 solar zenith angles on the opposite hemisphere. At the previous meeting we presented a mechanism to generate ionopause surface waves from the subsolar location, so here we concentrate on the subject as to how the K-H mode is stabilized at the flank of the ionotail in the downward electric field side. We will show that the (K-H) viscous interaction between the high-speed solar wind flow and the low-energy ionospheric plasma yields a large number of energetic ionospheric ions (mostly composed of O+), which, in turn, stabilize the K-H mode downstream of them due to their large Larmor radii.