Accelerating Disturbances in Polar Plume and Inter-plume

G. R. Gupta[1,2], D. Banerjee[1],L. Teriaca[3], S. Imada[4] and S. Solanki[3]

[1] *Indian Institute of Astrophysics, Koramangala, Bangalore 560034, India*
[2] *Joint Astronomy Programme, Indian Institute of science, Bangalore 560012, India*
[3] *Max-Planck-Institut für Sonnensystemforschung (MPS), 37191 Katlenburg-Lindau, Germany*
[4] *Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Kanagawa, Japan*
email: girjesh@iiap.res.in, contact: +91-80-2553-0672

We present EIS/Hinode & SUMER/SoHO joint observations allowing the first spectroscopic detection of accelerating disturbances as recorded with coronal lines in inter-plume and plume regions of a polar coronal hole. From time-distance radiance maps, we detect the presence of propagating disturbances in a polar inter-plume region with a period of 15 to 20 min and a propagation speed increasing from 130 ± 14 km s^{-1} just above the limb, to 330 ± 140 km s^{-1} around $160^{''}$ above the limb. These disturbances can also be traced to originate from a bright region of the on-disk part of the coronal hole where the propagation speed was found to be in the range of 25 ± 1.3 to 38 ± 4.5 km s^{-1}, with the same periodicity. These on-disk bright regions can be visualized as the base of the coronal funnels. The adjacent plume region also shows the presence of propagating disturbance with the same range of period but with propagation speeds in the range of 135 ± 18 to 165 ± 43 km s^{-1} only. A comparison between the time-distance radiance map of both regions, indicate that the disturbances within the plumes are not observable (may be getting dissipated) far off-limb whereas this is not the case in the inter-plume region. Conclusions drawn from these observations in terms of accelerating waves or high speed jets/upflows will be discussed.

Keywords: Sun: corona; Sun: transition region; Sun: UV radiation; Sun: oscillations; waves