Geophysical Research Abstracts
Vol. 13, EGU2011-10811, 2011
EGU General Assembly 2011

Do flow bursts penetrate into the inner magnetosphere?

Stepan Dubyagin (1,2), Victor Sergeev (2), Vassilis Angelopoulos (3), Andrey Runov (3), Rumi Nakamura (4), Wolfgang Baumjohann (4), Natalia Ganushkina (1), James Mcfadden (5), and Davin Larson (5)

(1) Finnish Meteorological Institute, Helsinki, Finland (stepan@geo.phys.spbu.ru), (2) St. Petersburg State University, St. Petersburg, Russia, (3) University of California, Los Angeles, USA., (4) Space Research Institute, Austrian Academy of Sciences, Graz, Austria, (5) Space Sciences Laboratory, UCB, Berkeley, USA.

Recent studies have shown that only a small part of the fast flow bursts observed at mid-tail penetrate into the inner magnetosphere, rising questions regarding their role for particle injections. Motivated by these findings we compared observations at two radially aligned spacecraft in the high-beta nightside plasma sheet to investigate which physical parameter controls the penetration efficiency of the flow burst observed at the outer spacecraft. We showed that the inferred plasma tube entropy $PV^{5/3}$ demonstrates the best prediction efficiency compared to other parameters (e.g. V_x or B_z). Its minimal value at the outer probe during the flow burst compared to its preflow value at the inner probe is able to discriminate between "penetrating" and "non-penetrating" events. Our results give an explanation for the relatively small fraction of deeply penetrating BBFs and provide a strong argument in favor of the bubble model of fast flow bursts and plasma injections.