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Weak, Quiet Magnetic Fields Seen in the Venus Atmosphere

Tielong Zhang (1), Wolfgang Baumjohann (1), Christopher Russell (2), and Janet Luhmann (3)

(1) Space Research Institute, Austrian Academy of Sciences, Graz, Austria (tielong.zhang@oeaw.ac.at), (2) IGPP, University of California, Los Angeles, USA , (3) Space Sciences Laboratory, University of California, Berkeley, CA, USA

The existence of a strong internal magnetic field allows probing of the interior through both long term changes of and short period fluctuations in that magnetic field. Venus, while Earth's twin in many ways, lacks such a strong intrinsic magnetic field, but perhaps short period fluctuations can still be used to probe the electrical conductivity of the interior. Toward the end of the Venus Express mission, an aerobraking campaign took the spacecraft below the ionosphere into the very weakly electrically conducting atmosphere. As the spacecraft descended from 150 to 140 km altitude, the magnetic field became weaker on average and less noisy. Below 140 km, the median field strength became steady but the short period fluctuations continued to weaken. The weakness of the fluctuations indicates they might not be useful for electromagnetic sounding of the atmosphere from a high altitude platform such as a plane or balloon, but possibly could be attempted on a lander.