Geophysical Research Abstracts
Vol. 15, EGU2013-2710, 2013
EGU General Assembly 2013

Radial evolution of magnetic cloud properties

Tanja Rollett (1), Astrid M. Veronig (1), Martin Leitner (1), Bojan Vrsnak (2), Christian Möstl (1), Charles J. Farrugia (3), and Manuela Temmer (1)

(1) University of Graz, Institute of Physics, Austria (tanja.rollett@uni-graz.at), (2) Hvar Observatory, Faculty of Geodesy, University of Zagreb, Croatia, (3) Space Science Center and Department of Physics, University of New Hampshire, Durham, New Hampshire, USA

Magnetic clouds (MCs) are characterized as intervals of enhanced, smoothly rotating interplanetary magnetic field, low plasma beta and temperature in spacecraft in situ data and can be part of ICMEs. In this study we analyze the radial evolution of MCs using a sample of events detected by radial aligned spacecrafts at different heliocentric distances. The data-sets are fitted with a force-free, constant-alpha flux rope model. Using the outcome of this fitting model we calculate the estimated cross section diameter (assuming a cylindrical flux tube), the poloidal and the axial magnetic field, the current, the magnetic flux and the inductance. All these parameter are further studied as a function of heliocentric distance. Strong variations of the current or the magnetic flux could be a hint for magnetic reconnection between the MC and the solar wind. This work has received funding from the European Commission FP7 Project COMESEP (263252).