CHARACTERIZATION OF OVERLAPPED MAGNETIC CLOUDS USING AMCDA SOFTWARE

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Abstract: Magnetic Clouds (MCs) constitute a subset of Interplanetary Coronal Mass Ejections (ICME), are observed by different satellites in the solar wind and have peculiar properties used in their identification. Properties related to the magnetic field, such as smooth vector rotation and greater intensity than the environment average, are used in its identification [1]. The MCs can be ideally characterized by a force-free model and thus approximated by the geometry of infinite cylinders or flux ropes [2]. In the real case, the Minimum Variance Method (MVA) is applied to adjust the data obtained via satellite to a force-free model and to identify the type and orientation of the flux rope. For this purpose, the Automatic Magnetic Cloud Data Analysis (AMCDA) [3] software provides five distinct screens containing, in short: the maximum and minimum variance planes obtained by the cross section of the cylinder; the Radial (B_R), Azimuth (B_A) and Tangential (B_T) of the magnetic field components in the flux rope; the magnetic field ($|B|$); the longitudinal (B_{Lon}) and latitudinal (B_{Lat}) angles of the MC; a summary table with quantitative results obtained at the end of processing. Thus, this work aims to characterize two overlapped magnetic clouds identified in the periods, from April 13, 2006 to April 14, 2006 and, from November 9, 2004 to November, 10, 2006. As a result, two bipolar magnetic clouds with opposite orientations and two MCs, one bipolar and one unipolar, respectively, were obtained.

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