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论文

CME和冕流结构相互作用机制的数值模拟研究

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摘要: 1980年4月14日SMM卫星曾经观测到了爆发在两冕流结构之间开放磁场中的CME独特的传播特征以及冕流结构的畸变和偏转。本文采用了2.5维MHD方程,用数值模拟方法研究了CME和冕流结构之间复杂的相互作用过程.模拟结果不但展现了SMM卫星所观测到的CME的独特的传播特征和冕流结构的畸变和偏转,而且还发现了在冕流结构和CME的相互作用中,冕流结构内部轴向磁场分量的反转效应.模拟结果对磁云和磁暴活动的研究也具有一定的意义.

关键词: 日冕物理抛射 冕流结构 相互作用 数值模拟

Numerical simulation study of the mechanism of the interaction between CME and helmet streamer

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Abstract: On April 14, 1980, the spacecraft SMM had observed the characteristic propagating of the CME erupting in the open magnetic field between two helmet streamers, and the distortion and deflection of the helmet streamer. In this paper, by using the 2.5-

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dimension MHD equations, the complicated process of the interaction between the CME and helmet streamer has been studied in the method of numerical simulation. In the simulation result, not only have the characteristic propagating of this kind of CME, and the distortion and deflection of the helmet streamer observed by spacecraft SMM been showed, but also the inverse effect of the axial component of the magnetic field inside the helmet streamer has been found. This simulation result is also helpful for both the