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Structure of the interplanetary magnetic cloud estimated by fitting the torus-shaped flux rope model

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In fitting analysis using force-free magnetic flux rope model, according as relative position between the spacecraft and the magnetic cloud, curvature of the magnetic field could become a crucial factor that determines fitting results. In this report, we will focus on a typical interplanetary magnetic cloud event observed by the ACE satellite on April 16, 1999 and show the usefulness of the torus model in helping us estimate reasonable physical solutions for magnetic cloud events for which we had previously failed to find magnetic field structures using the cylindrical model. Additionally, we will present fitting results using a large aspect ratio torus that is under construction now.