Interpretation techniques for crustal magnetic fields in the presence of solar fields, instrument or mission challenges

*Michael E Purucker[1], Dhananjay Ravat[2], Benoit Langlais[5], Alexander Michels[3], Jack Connerney[4], Suzanne McEnroe[3]

1. NASA/GSFC, Greenbelt, MD, USA, 2. Univ.Kentucky, Lexington, KY, USA, 3. NTNU, Trondheim, Norway, 4. ADNET/NASA, Greenbelt, MD USA, 5. CNRS, U.Nantes, Nantes, France

There are many excellent descriptions (cf. Blakely, Cambridge, 1995) of interpretation techniques for crustal magnetic fields. But all magnetic field data sets have been gathered in the presence of other magnetic fields that complicate the interpretation of the crustal/lithospheric field component. Magnetic fields in the heliosphere contribute directly (via the solar wind) or indirectly (via currents on the magnetopause) to the magnetic fields measured by the satellites. Instrument and mission considerations are also of importance in properly interpreting magnetic field data sets, or in combining data sets collected during multiple missions. Because space missions (MAVEN, MGS) often collect data at multiple altitudes, we also have insight into the 3-D configuration of magnetic boundaries. One of the easiest interpretational techniques to implement is to plot scatterplots of along-track magnetic field gradients, either of the radial or scalar fields, along with comparable plots of altitude above the surface. In this invited review, we will discuss novel and established interpretations from magnetic field missions to the Moon, Mars, Mercury, and the Earth.

