1106-86-2034 **Alain Plattner*** (aplattner@csufresno.edu) and **Frederik J Simons**. *High-resolution crustal magnetic-field model of the Martian South Pole using altitude vector Slepian functions.*

Within the last decade a variety of local planetary crustal magnetic field inversion methods has become available, including spherical wavelets, spherical cap harmonics, Slepian functions, and altitude Slepian functions. To date, however, examples of where local inversions have unveiled previously obscured features and hence contributed to our practical knowledge of planetary crustal fields are wanting. We apply our altitude vector Slepian inversion to obtain a local crustal field model for the Martian South Pole. This model reveals previously unseen features. The magnetic-field data collected by NASA's Mars Global Surveyor satellite mission are particularly suited for a local inversion. Their quality and altitude vary strongly and include a patch of low-altitude, low-noise data over the South Pole. Besides inverting for a crustal magnetic-field model of the Martian South Polar region, we investigate the effect of inverting for the crustal field of subregions therein. We observe that the inversion of regions containing fields of strongly varying intensity can lead to artifacts. These can be avoided by inverting for subregions of roughly homogeneous intensity. We conclude that local methods can be of great service even if global high-quality data are available. (Received September 15, 2014)