

Title: Lithospheric anomaly magnetic field model over the Indian-subcontinent and adjoining ocean-basins: correction and modelling of the satellite data

Abstract:

Data from the Swarm satellite mission spanning the years 2014 to 2020 have been utilized to model the lithospheric magnetic field over the Indian subcontinent and adjacent oceanic regions. To mitigate the influence of external sources, satellite passes during quiet day-night periods have been preferentially selected. Subsequently, utilizing sophisticated models such as CHAOS, the contributions from both the external and main magnetic fields are effectively subtracted, yielding residual lithospheric data. Further refinement of the residual data involves several procedures, including manual elimination of incomplete and overlapping satellite passes, as well as the application of filters to eliminate spikes and other anomalous signatures. The resultant corrected lithospheric field data is then subjected to inversion techniques, notably employing damped least inversion methodology. This approach entails expanding Legendre polynomials of harmonic terms ranging from orders 6 to 50, facilitating the generation of a comprehensive lithospheric magnetic anomaly map covering India and its neighboring regions. The regional lithospheric model obtained through these processes holds significant scientific importance, particularly in the context of studying diverse tectonic provinces across the Indian subcontinent and surrounding oceans. This discussion outlines the various steps involved in processing satellite data to develop the lithospheric anomaly model and elucidates the magnetic signatures of distinct tectonic regions.