Geophysical Research Abstracts
Vol. 20, EGU2018-3384, 2018
EGU General Assembly 2018


# Correction of long-wavelength component of Australian aeromagnetic compilations using equivalent source technique

Yixiati Dilixiati (1,2), Jörg Ebbing (1), and Nils Holzrichter (1)

(1) Institute of Geosciences, University of Kiel,Kiel, Germany , (2) Seismological Bureau of Xinjiang Uygur Autonomous Region, Urumqi, China

Australia has one of the best aeromagnetic coverages with high-resolution on Earth. The magnetic anomaly map of Australia is a compilation of all available surveys, which contain 19 million line-kilometres of acquired magnetic survey conducted over than 50 years. Although the continental scale aeromagnetic compilation provides high-resolution merged data, the long wavelength part of the compilation data is often distorted. On the one hand, it is because of limited spatial extent of individual surveys, and on the other hand, due to trends artificially introduced through the data processing. As surveys are joined together, adjustments (tilts, datum shifts) made to ensure a good fit of shorter wavelength anomalies at the survey boundaries, but left long wavelength unreliable.
By contrast, the satellite coverage and data quality is more uniform than airborne surveys. Thus, homogeneous datasets can be acquired over a continental scale area, which reflect the long-wavelength information of the magnetic field. Therefore, the data quality of aeromagnetic compilation can be enhanced using satellite data if we can find a tool to merge these two data sets.
The equivalent source method is chosen for this purpose because of the actual sphericity of the earth and its ease of application to data from different altitudes. Various source depth are tested to determine optimum source depth from inversions with equivalent source. We analyze if there is compatibility between the long-wavelength aeromagnetic and satellite anomaly fields or if a spectral gap is still present. The high correlations part of the long-wavelength satellite anomaly can be merged with aeromagnetic data to improve the long-wavelength component of the aeromagnetic data.