

EGU21-3252

<https://doi.org/10.5194/egusphere-egu21-3252>

EGU General Assembly 2021

© Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.



Bayesian inversion of magnetic data: A case study of Australia

Yixiati Dilixiati, Wolfgang Szwillus, and Jörg Ebbing

Christian-Albrechts-Universität zu Kiel, Institute of Geosciences, Kiel, Germany (dilixiati.yixiati@ifg.uni-kiel.de)

We apply a Bayesian inversion based on the Monte Carlo Markov chain sampling scheme to magnetic anomaly data of Australia. In our inversion, we simultaneously solve for the susceptibility distribution and the thickness of the magnetic layer. Due to the excellent data coverage, we test our method for Australia. As data source, we use aeromagnetic data of Australia, which are conformed to the recent satellite magnetic model, LCS-1, by an equivalent dipole source approach combined with a spherical harmonic representation. The data are presented in different heights in order to minimize local scale features and to maximize sensitivity to the thickness of the magnetic layer. As constraint, we use estimates of the magnetic layer based on measurements of geothermal heat flow and crustal rock properties. Hereby, we assume that the Curie isotherm does coincide with the deepest magnetic layer. We systematically explore, the effect of increasing model resolution and of the geothermal heat flow values considering their accuracy and quality. The set-up will in the next step be applied to other continental areas of the Earth.