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Anomalies of the Earth's magnetic total field in Germany – a new homogenous, high-resolution compilation

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Anomalies of the Earth's magnetic total field reveal important information about geological structures within the crust. Here, we will present for the first time a homogenous map of anomalies of the Earth's magnetic total field for entire Germany. This high-resolution map is based on 50 individual ship based, airborne or ground surveys that were conducted between 1960 and 1990, and which are complemented by 17 new surveys after German re-unification, especially along the former border between both German states. The corresponding data sets were related to different geomagnetic reference systems, different epochs, and different altitudes. Some of them never got published before. The new map with a grid spacing of 100 m images the entire anomaly pattern in Germany consistently in an altitude of 1000 m above sea level with the DGRF1980.0 as reference system. For the interpretation of magnetic anomalies the entire coverage of each anomaly including its dipole character is of special importance. Therefore, this homogenized and for the first time complete anomaly data set offers some new insights into crustal structures in Germany. With this map the geoscience community has now new, basic information at hand for any kind of regional geophysical and geological research. On the large scale, regional tectonic units as the Variscan terranes in south and central Germany or the extent of old Scandinavian crust beyond North Germany as a relic of the collision between Baltica and Avalonia are well imaged by the magnetic anomalies. On the small scale, also details of local structures like the prominent volcanic areas of the Vogelsberg or the Eifel region are well exposed.