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A magnetic susceptibility model of the Earth

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Magnetic susceptibility is one of the fundamental properties of the magnetic minerals present in the Earth's crust and upper mantle. Due to the inherent non-uniqueness of inverting magnetic field data for the underlying magnetization, neither the magnetization nor the magnetic susceptibility has been uniquely recovered from magnetic field measurements up to now.

In this study, we show that by means of the vector Spherical Harmonic formalism and under the assumption of purely induced magnetization, most of the magnetization and the magnetic susceptibility over the continents can be uniquely recovered for a known inducing magnetic field. We present our results based on a Spherical Harmonic Model of the latest version of the World Digital Magnetic Anomaly Map.