Anisotropy of the geomagnetic field detected with directional Poisson wavelets on the sphere

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The calculation of geomagnetic field models is a fundamental task in geomagnetism. Up to now models have been calculated with isotropic priors about the magnetic field. As the geomagnetic field is not isotropic that approach might not be optimal. The main goal of this project is to analyze the recently obtained high quality models of the geomagnetic field based on CHAMP satellite data with the help of the newly developed directional Poisson wavelets on the sphere. This will allow us to asses and quantify the position and scale dependent locally anisotropic correlation structure of the crustal field. In a first step we apply the wavelet transform to the radial component of the geomagnetic field, obtaining information about dominant directions and scales of the locally anisotropic features. This information can later be used to increase the accuracy of the field inversions if this kind of non-isotropic information are taken into account as prior information for the Bayesian inversion process.