

## **Multiscale feature extraction of potential fields using Poisson wavelets**

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The Earth's geoid gives information about the inner structure and mass distribution of the Earth's interior. It is related to the geodynamical processes operating inside our planet. Analyzing the geoid is a currently often addressed scientific subject, especially since satellite data allow the global analysis of the geoid. Much effort is made on detection and interpretation of structures in the ocean. Reports about undulations of the spatial scale of about 200 km are well established and can be explained by different processes, including secondary convection patterns in the mantle. Also suggestions about undulations of larger scales, from 400 km to 1300 km, exist, but they still need to be confirmed. In our work, we address this issue. We use the method of continuous wavelet analysis in order to detect directional features in the 400-1300 km waveband in the geoid signal of the Pacific ocean. Therefore, we developed directional Poisson wavelets on the sphere and applied them to recent geoids provided from different teams derived from GRACE satellite data, as well as on satellite altimetry derived gravity anomalies and to the Gebco bathymetry. Dominant directions and scales for the different data sets are detected and compared. Dominance filtering shall avoid interpretation of wavelet transform signals that is dominated by noise. After a presentation of the directional analysis method, we discuss our results and their geodynamic implications.