Anisotropic Isostatic Analysis Using the Continuous Wavelet Transform

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A new technique based on an anisotropic isostatic admittance function and the two-dimensional continuous wavelet transform (2D-CWT) will be presented in this paper. This approach is considered necessary because existing isostatic analyses tend to use the approximation of an isotropic admittance function and the Fourier transform technique. It is argued here that the use of an anisotropic function mimics reality more effectively, and the wavelet transform allows for a more regional analysis that preserves spatial structure and relationships.

Results from the new technique will be presented over Australia, where there is a reasonably homogeneous coverage of gravity and terrain data. These results indicate that the new wavelet-based anisotropic technique does offer an advance upon existing methods. Comparisons of lithospheric thicknesses, estimated using the new technique, with those derived from the SKIPPY teleseismic experiments, conducted by the Australian National University, show quite good agreements, thus indicating that the new technique is effective.