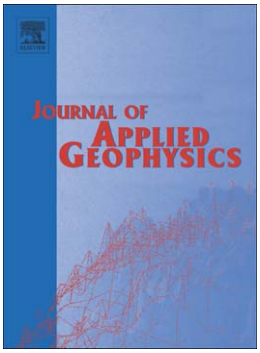

2-D Fourier transform analysis of the gravitational field of Northern Sinai Peninsula

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2-D Fourier transform analysis of the gravitational field of Northern Sinai Peninsula.

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Abstract

The Sinai Peninsula has fascinated the consideration of many geophysical studies as it is influenced by major tectonic events. Those are (1) the Mesozoic to Early Cenozoic tectonically active opening of Tethys, (2) the Late Cretaceous to Early Tertiary (Laramide) Syrian arc system, due to closing of the Tethys (3) the Oligo-Miocene Gulf of Suez rifted basin, and (4) the Late Miocene to Recent transform Dead Sea-Gulf of Aqaba rift. Moreover, the shear zones inside Sinai have affected intensely the structure development of the northern Sinai area. 2-D Fast Fourier Transform (FFT) analysis has been applied to transfer the data from space domain to frequency domain, in which basic gradients and derived gradients have been estimated. The frequency domain operations resulted in frequency filtering, first and second degree xyz gradients, horizontal, total (analytical signal) and tilt gradients, maximum horizontal gradient amplitude (total horizontal derivative), and theta map. As a result, the basic and derived gradient maps have succeeded to outline the major structure elements of Northern Sinai Peninsula. Comparisons with some well known surface structures showed a large degree of matching.

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