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## Estimation of Co-seismic gravity change for the earthquake in Koyna-Warna region

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Koyna-Warna, region Maharashtra, India has been witnessing seismic activities over last four decades. The seismicity in this region is ascribed as reservoir triggered in the critically stressed intraplate environment. Several geophysical observations are made and being made in this region, including repeat gravity recordings. The earthquakes can be modelled as dislocations on a rectangular plane in a homogenous half-space. Gravity change is caused due to deformation in a homogenous half-space and is calculated across the fault for the earthquakes in Koyna-Warna region using Okubo (1992) to recognise magnitude of co-seismic gravity changes and its spatial extent. Okubo's relation is preferred as one can predict gravity change up to the order of  $10^{-8} \text{ ms}^{-2}$  which otherwise would require superconductivity or absolute gravimeter which can detect such small changes in gravity. The commutated values are in the order of few micro-gal, which also include the effects of changes in height following the deformations. The contours for positive gravity values and those for negative values are separated by fault line. The results obtained by the co-seismic model matches well with the values obtained by the gravity surveys. Maximum and minimum gravity change are caused by the magnitude of the dislocation vectors. On the contrary, fault size has a much smaller effect upon the gravity change. This exercise may help us in understanding the source mechanism of earthquakes when compared with observed gravity changes and in planning of observation stations.

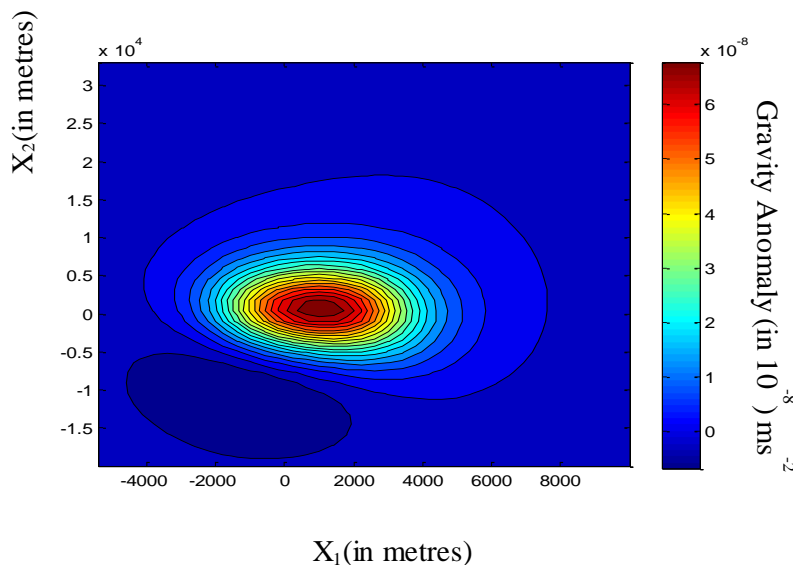


Figure 1. Gravity Change for Koyna-Warna Earthquake

*References:*

[1]. Okubo,S., Gravity and Potential Changes due to a Shear and Tensile Faults in a Half-Space, Journal of Geophysical Research, vol.97, no. B5, pages 7137-7144, 1992

[2] Chinnery, M. A., The deformation of ground around surface faults, Bull.Seismol.Soc.Am, 51,355-372, 1961

