

# **DERIVING TRIDIMENSIONAL DISPLACEMENTS FIELDS USING GEODETIC TECHNIQUES: PRELIMINARY RESULTS**

Pablo J. Gonzalez, Jose Fernandez and Nemesio Perez

Instituto de Astronomia y Geodesia, CSIC-UCM, Madrid, Spain

We evaluate the possibility of using a least square and geostatistical approach to estimate tridimensional displacement fields due to seismic and volcanic activity. We start to forward model tridimensional displacements due to earthquake and volcanic activity, using well-know close analytical formulae,(Okada, 1985 and Mogi, 1958), then we study different possibilities to merge data capture the deformation fields by means of geodetic space techniques like radar interferometry and terrestrial based measurements, GPS. Different kinds of interpolation methods for the case of using ground point based measurements are tested. Finally, a weighted least squares approach is used to find a BLUE estimation of the tridimensional displacement field and its variance-covariance matrix.