



Independent component analysis of ground deformation at Neapolitan volcanic area

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Development of innovative and quantitative methods is one of the main ingredients for future progresses in volcanic risk assessment in the long and short time scales. Here we apply an innovative, in geophysics, multivariate statistical technique named ICA (Independent Component Analysis). This technique allows the separation of independent signals from a mixture of records. Heuristically ICA extrapolate components independent in respect with a fourth order statistics, considering not only the covariance matrix, but also the moments of higher order. We will apply this method to a set of signals recorded at the CGPS monitoring network of Neapolitan volcanic area. This allows us to recognize the regional ground deformation which will be separated from the stochastic components. The analysis enlighten that the regional components are periodic thus linked to well known periodic phenomena as earth tides, oceanic noise and others. On the moment that oscillatory phenomena are stationary, we can investigate the ground deformation by means a simple stationary analysis.