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Analysis of Koyana Earthquake Datasets – A New Approach

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Koyna earthquake data sets are considered for the analysis of nonlinear processes of spatial distribution of the epi - centers, magnitude, and focal depth. The auto correlation coefficients are computed for the parameters namely magnitude, latitude, longitude and focal depth independently these auto correlations are significant indicating that they are associated within each of these parameters. Further, it is observed that the auto correlations are not cyclic.

Also, hierarchical cluster analysis is implemented on these parameters and found that three independent clusters are formed, but however, the third cluster is virtual redundant. Further, Euclidean distances are computed in order to know the distribution of the patterns between these parameters and found that distances between the latitude versus longitude; magnitude versus latitude; magnitude versus longitude fell into non-linear category and the distances are far apart. From these two significant cluster patterns it may inferred that the energy distribution is oscillating like a ping-pong ball originating some where in the middle of these two clusters at a particular depth. This attempt may open up to an important area of research connected to earthquake predictive modeling, where it may probably help in understanding the scattering phenomenon of earthquake energy, in space, time, and magnitude. Further, it may help in understanding the fractal behavior of 3-D wavelet form.

Keywords: Nonlinear, Cluster, 3-D Scattering, Earthquake Energy, Fractal, Wavelet