

This paper presents an application of nonlinear science to investigate the alteration of electroencephalographic (EEG) signals in two brain states, i.e. idle state and imagination of movement. Based on Coarse Graining Spectrum analysis (GCSA) we extract fractal components from the recorded EEG signal in the frequency domain. The aim of this work is to extract reliable features based on random fractal components to apply as features in a Brain Computer Interface (BCI). Data recorded from six subjects for a BCI system is used to evaluate the proposed method. The result derived from Soft Margin Support Vector Machine classification shows that there is significant discrepancy in spectral components that could be a powerful method in investigating brain activities.