



Characterization of volcano state using multivariate time series clustering: Mt. Etna, a case of study

Roberto Di Salvo (1), Placido Montalto (1,2), and Giuseppe Nunnari (1)

(1) Università degli studi di Catania, Dipartimento di Ingegneria Elettrica, Elettronica e dei Sistemi, (2) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Catania (montalto@ct.ingv.it)

Time series clustering is an important task in data mining issues because lets the extraction of implicit, previously unknown, and potentially useful information from large collection of data.

Studying trends from time series represents a challenge in several areas including geophysics environment research. While most of the traditional time series clustering technique deals with only univariate time series, the proposed method allows to cluster multivariate time series which sampling rate is different according to the nature of signal.

This novel approach is mainly based on dynamic time series segmentation for features extraction, and uses Self Organized Maps to cluster themselves. The aim of the method is to evaluate the state of Mt. Etna volcano during the period spaning from 1996 to 2003 using different geophysical data recorded from monitoring network.