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Statistical behavior of the seismic electric signals associated to two earthquakes of 1993 in Mexico.

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Prediction of natural phenomena has always been a well-pondered problem. Earthquakes (EQ) are the natural phenomena which predictability is especially important in terms of social and economic impact. Recent studies related with earthquake prediction involve the statistical study of the ground electric self-potential behavior. Previous significant results about the complexity of this kind of process encourage us to study the statistical behavior of the ground electric self-potential recorded in Guerrero state, Mexico. This region is characterized of large seismicity. The electric self-potential variations were recorded in the Acapulco station directly from the ground. The sampling period was four seconds and stored from March to December on 1993. Two significant earthquakes occurred in that year near of this station, May 15^{th} and October 10^{th} whose magnitudes were M_W = 6.0 and M_W = 6.5 respectively. The analysis of the time series began with a moving average of the original series in order to filter the very high frequencies. The next step of the analysis was the visual inspection of the complete filtered signal. This inspection revealed the presence of seismic electric signals (SES) a few days before the EQ and with duration of some hours. Then, some segments of the time series were choosing before and after the EQ, and subsequently, a power spectral technique was applied in segments of about six hours. The obtained results show a behavior of a power law in the segments of the series coincident with the SES. That could mean a kind of organization in the system previous to the EQ.