



Natural time analysis of entropy of evolution of seismic activity in the Tehuantepec Gulf in Chiapas México since 2012 until 2017 and associated with the M8.2 EQ, occurred on September 07, 2017.

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The extreme events produced in complex systems are very difficult to predict. The natural phenomena that occur in the Earth, like climate or seismicity are examples of events able to produce catastrophic disasters representing life and economic losses. As it is well known, a main shock of $M=8.2$ struck a few minutes before midnight on September 07, 2017 within subduction zone between Cocos and North American plates in the Tehuantepec Gulf in Chiapas, México. In this work we present a study of entropy by means of the natural time analysis of the seismic activity, since 2012 until 2017, registered within the area of Tehuantepec Gulf in Chiapas State, México. During this period, five earthquakes with magnitude $M>6.5$ were monitored, including the extreme event of $M=8.2$. Our analysis of entropy S , in natural time domain, as well as the reversal entropy, S_- , and the entropy change $[U+F044] S = S - S_-$, allows the identification of changes in the underlying dynamics. Our finding shows that ΔS of the entropy in natural time upon time reversal display a non-zero change during the period analyzed indicating the non-reversibility of the seismic processes.