## Multifractal Behavior of Seismicity in Sichuan Province

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A destructive Wenchuan Earthquake (also known as Sichuan Earthquake) of May 12, 2008 (Mw=7.9; location 31°N, 103.32°E) occurred as a result of motion on a Northeast striking thrust fault on the northwestern margin of the Sichuan basin. It is direct manifestation of active crustal shorting that produced and supports the Longmen Shan range front. This devastating earthquake occurred on the series of large, crustal thrust faults that the range front and accommodation crustal shorting. Multifractal analysis used to characterize the seismicity of region and to predict the future large earthquake. 50 events (hypocenter) and 100 events (hypocenter) consecutive windows with 50% overlapping have been considered to estimate Generalized Correlation Dimension  $(D_{q)}$ . A good correlation is found between the Correlation Dimension  $(D_2)$  and earthquake occurrence. The D2 value varies from 0.782 to 1.915 for 100 events windows with scaling of length r=15 to 200. For 50 events with scaling length r=15 to 200, D<sub>2</sub> varies from 0.561 to 2.215. Temporal variation of Generalized Correlation Dimension  $(D_q)$  reflects that  $D_q$  (q=2, 4, 6, 8,....24, 30) decrease prior to main shocks<sub>1,2</sub> (Fig 1) The decrease and increase of the  $D_q$  with the space reflects the clustering and declustering of the hypocenter, respectively. Variation of  $D_q$  with time indicates the accumulation and release of the strain energy, respectively. The slope of  $D_q$  with time gives the rate of accumulation and release of the strain energy.

Key words: Wenchuan Earthquake, Multifractal, Temporal variation, Generalized Correlation Dimension, Longmen Shan.



Figure 1. : Temporal variation of Generalized Correlation Dimension ( $D_q$ ) for the 100 events window with scaling radius r =15 km to 200 km

## **References:**

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