



## **A spatiotemporal non-extensive approach to investigate seismicity of 6th April 2009, ML5.8, L'Aquila (Central Italy) earthquake.**

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In a recent paper (Telesca, 2010) the non extensive nature of frequency-magnitude distribution before and after L' Aquila earthquake using the classical non-extensive formulation of Sotologo et al. (2004) was presented. The application of non-extensive statistical mechanics is appropriate to systems which are far from equilibrium; effectively describing entities with multifractal distributions of their elements, where non-linearity, long-range interactions and intermittency are important, such as seismicity (Tsallis, 2009).

In the present work non-extensive statistical mechanics (NESM) was applied to the same as in Telesca (2010), 2005-2009 seismicity catalogue of the L'Aquila area (Central Italy) encompassing the 6th April 2009 earthquake, ML5.8, extending the analysis using interevent times and distances (Abe and Suzuki, 2003; 2005). Based on the approach presented in Vallianatos (2009) and Vallianatos and Sammonds (2010) the cumulative probability function for the seismic moment, the interevent time and the interevent distance distributions was calculated within the following time intervals: 27 July 2005 – 28 March 2009 (1), 27 July 2005 – 2 April 2009 (2) 27 July 2005 – 6 April 2009 (3), 27 July 2005 – 19 May 2009 (4) and 27 July 2005 to 1 July 2009 (5), allowing the q-triplet to be determined before and after L'Aquila earthquake. The results are discussed in the frame of potential application of q-triplet along with other approaches as a possible index of the earthquake preparation process.

Acknowledgements F.V. acknowledges support from EU grant PIEF-GA-2009-235433 "NEXT EARTH"

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