Alex Karagrigoriou, University of Piraeus (Greece)

Title. Evaluation of Seismic Activity via Poisson Hidden Markov Models

Abstract. Seismic hazard evaluation is always considered to be a research problem of high scientific importance due to the consequences that are often associated with earthquake occurrence. One such region that attracts scientific attention due to its technics, is the region covering the areas of Central and South America. This work is devoted to the evaluation of earthquake occurrence probabilities in the seismic zones that cover parts of the above region. The evaluation is undertaken by implementing the hidden Markov model, specifically the Poisson HMM (PHMM), which is a dual discrete-time stochastic process. The parameters of interest of the underlying Poisson distributions which represent the hidden states of the process are estimated and the PHMM methodology is implemented. A comparative analysis shows that the classical Poisson model is preferred in only 1 out of 10 seismic zones with the PHMM prevailing in all others. The steady state probabilities are also furnished.