The research of spherical time-space ETAS model

*熊 子瑶[1]、 庄 建倉[1]

*Ziyao Xiong[1], Jiancang Zhuang[1]

1. 統計数理研究所
1. The Institute of Statistical Mathematics

The widely used space-time ETAS (epidemic-type aftershock sequence) model was developed by Ogata (1998). This model successfully explains foreshocks and high order aftershocks in earthquake sequences and provides a very effective tool for seismic activity analysis. However, this space-time ETAS model is only suitable for the study within a small space range. When the space range is large, since the earth is a sphere, the simulation results of the model will produce errors. In this study, we reformulate the model from its planar version to a spherical version, to analyze and forecast global seismicity or seismicity in high latitude regions. The new model is verified by applying it to the global CMT catalogue. The results show that the new model can simulate the global seismicity variation well. It provides support for better modeling of seismic activities and seismic interactions in global regions.