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## Natural time analysis of large earthquakes in Japan

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Seismicity as a critical phenomenon has been actively discussed by many authors (e.g., Bak and Tang., 1989; Turcotte, 1997; Sornette, 2000; Rundle et al., 2003; Keilis-Borok and Soloviev, 2003). It has been shown that seismic electric signals (SES) and EQs reveal dynamic evolution characteristic to critical stage when their time series is analyzed in the framework of natural time, which was introduced by the Varotsos' group (e. g., Varotsos, 2005; Varotsos et al., 2002). The possible usefulness of natural time analysis in predicting catastrophic events has been demonstrated not only for the subjects of our immediate concern, but also for other critical phenomena, including sudden cardiac death (Varotsos et al., 2004; Varotsos et al., 2005). Here we investigate whether the above properties of seismicity were found also before 1995 Kobe earthquake and 2003 other large M7-class earthquakes in Japan.

Keywords: Natural Time, Seismicity, Critical phenomena