Spatio-temporal variation of plate interactions in the Tokai District as viewed from leveling data (2)

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Sagiya and Oishi (2006) discussed the vertical crustal displacement profile between Numazu and Nagoya since 1880's. However, complete leveling data were available only before 2001 and the discussion about the Tokai slow slip event during 2001-2005 was incomplete. Therefore we conducted a leveling survey between Hamamatsu and Toyokawa, for a distance of about 22km, in November and December 2006. By combining the leveling data by GSI, Aichi Prefecture, and ourselves, we can discuss the vertical displacement pattern during the slow slip event. The displacement profile during 2000-2006 shows a striking uplift centered at around Lake Hamana, and a width of the uplift region is about 100km in E-W direction. Since the largest uplift was observed at Nagoya before 2000, the change in uplift pattern is significant. The amount of uplift rate change was as large as about 8mm/year. On the other hand, we do not see a subsidence around Nagoya associated with the slow slip. As we can identify similar uplift before the 1944 Tonankai earthquake and the earthquake caused a significant subsidence of about 30cm around Nagoya, the current uplift should be interpreted as a result of interplate coupling. The displacement pattern during 1900/01-1930/31 resembles that in 1977/79-2006, which includes a major slow slip event during 2001-2005. This indicates a possibility that similar slow slip events might occur before the 1944 Tonankai earthquake. We will also discuss a time dependent plate coupling model estimated based on these leveling data.