

A search for the Slichter mode excited by the 2004 great Sumatra-Andaman earthquake by use of the extensometer records in Japan

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This is a preliminary report on a search for the Slichter mode. The density of the Earth's inner core were estimated from inertia momentum by astronomical observations and the Earth's eigenfrequencies of long period fundamental modes of free oscillations in 1960's to 1970's. However, the mass of the inner core is around 1/60 of the total mass and the long period fundamental mode oscillations sample the inner core little. Thus, resolutions of the density estimation were poor. Our research target is to detect spectral signals of the Slichter mode 1S1 of the Earth's eigenoscillations excited by the 2004 Sumatra-Andaman earthquake of Mw9.0. The restoration force is gravitational buoyancy of solid inner core relative to the fluid outer core. Thus, its eigenperiod is roughly proportional to the density contrast between the lowermost outer core and the uppermost inner core. We calculate running spectra of 6 day length with a mutual time lag of 1 hour, corrected for the Earth's tide and the atmospheric pressure effect, to find three decaying spectral peaks at frequencies of around 0.046mHz (6.0 h), 0.053mHz (5.2 h) and 0.057mHz (4.9 h) in the spectra of only the extensometer records at Matsushiro with amplitudes 1-2 orders larger than those for PREM (Dziewonski and Anderson, 1982), although the eigenfrequencies are consistent with those (Dahlen and Tromp (1998) for PREM but seems to be inconsistent with those (Dahlen and Sailor, 1979) for 1066A. No signals are found in spectra of extensometer records at Amagase (Kyoto Univ.) and at Byobusan (TRIES).