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Anomalous splitting of 3S2 mode caused by anisotropic inner core and finite rigidity layer in liquid outer core

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It is well known that 3S2 mode of the earth's free oscillation shows anomalous splitting. Tsuboi and Saito (2002) suggested that the anomalous splitting may be explained using a soft-core earth model where a finite rigidity layer is put at the base of liquid outer core. By a numerical experiment, we examine whether or not the anomalous splitting is seen in free oscillation spectra of quasi-3S2 mode calculated for a soft-core earth model with anisotropic inner core. Synthetic spectra of the Bolivia earthquake in 1994 are calculated for the soft-core earth model. Applying singlet stripping method to the synthetic spectra, we estimate resonance functions of five singlets comprising the quasi-3S2 mode and obtain the variation of peak frequency of the resonance function versus azimuthal order of the mode. One of spherical harmonic expansion coefficients of the splitting function, C20, is estimated from the variation of the peak frequency. The estimated coefficient is smaller than that predicted for PREM with only anisotropic inner core. This result means that the anomalous splitting is not caused by finite rigidity layer at the base of liquid outer core.