



Problems related to precritically reflected phase PKiKP and the inner core boundary

V.M. Ovtchinnikov, P.B. Kaazik, D.N. Krasnoshchekov

Institute of Dynamics of Geospheres of Russian Academy of Sciences
(krasnd@idg.chph.ras.ru)

Recent seismic observations provide evidence that the inner core contains strong heterogeneity at a different scale length. To revisit this issue, measurements of the parameters of the PKiKP phase precritically reflected from the Earth's inner core boundary were made on a group of 4 seismic events located in Central Asia and recorded at distances between 3 and 93 degrees. The measured travel time residuals with PREM made only 0.5 sec. We also note three evidences for complex structure of the boundary between solid inner and liquid outer core: (i) the measured PKiKP amplitudes show great discrepancy with predictions by PREM standard model, making a factor of 100 in so called transparent zone (distances between 50 and 95 degrees), (ii) the detected PKiKP waveforms have high frequency content if compared to PcP and P phases, (iii) the detected PKiKP waveforms are frequently followed by a coda up to 200 s in duration, and such low-slowness coda has its frequency content comprised between 2 and 4 Hz. We discuss different models to explain the observed peculiarities of reflected waves and appropriate limitations on the technique used to determine the density jump on the outer-inner core boundary on the base of PKiKP to PcP amplitude ratio.