



Constraint on the 1D earth model near core-mantle boundary by free core nutation

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Free core nutation (FCN) is a normal mode of the rotating earth with fluid outer core (FOC). Its period depends on the physics of the mantle and FOC, especially the parameters near core-mantle boundary (CMB), like the density and elastic (Lame) parameters. FCN period can be determined very accurately by VLBI and superconductive tidal gravimetry, but the theoretical calculation results of FCN period from traditional approaches and 1D earth model (like PREM) deviate significantly from the accurate observation. Meanwhile, the influence of the uncertainty of a given earth model on nutation has never been studied before. In this work, a numerical experiment is presented to check this problem, and we want to see whether FCN can provide a constraint on the construction of a 1D earth model, especially on the gradient of material density near CMB.