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A global shear velocity model of the mantle from normal modes and surface waves

stephanie durand (1), eric debayle (1), yanick ricard (1), and sophie lambotte (2)

(1) Université de Lyon, ENS Lyon, CNRS, (stephanie.durand@ens-lyon.fr, eric.debayle@ens-lyon.fr, yanick.ricard@ens-lyon.fr), (2) EOST (sophie.lambotte@unistra.fr)

We present SEISGLOB1, a new global shear wave velocity model of the mantle based on the inversion of all published normal mode, splitting and coupling coefficients, and the large surface wave dataset measured by Debayle & Ricard (2012). Normal mode and surface wave data are sensitive to lateral heterogeneities of elastic parameters (Vs, Vp, ξ, ϕ, η) and density. We first only consider spheroidal modes and Rayleigh waves and restrict the inversion to Vsv (imposing an a priori correlation between Vp-Vsv and density-Vsv). Before the inversion, we correct the data from the crust effect using 3SMAC (Nataf & Ricard ,1996). The data are inverted up to the degree 20 of spherical harmonics. Vertical smoothing is imposed by splines and we discuss the effect of coupling/decoupling the inverted structure above and below the '670' discontinuity. The obtained model is in good agreement with existing ones and an interesting result is that the high velocity slabs do cross the '670' discontinuity and are still observed down to 800 km depth whatever the parameterization is, coupled or not at the '670' discontinuity.