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Receiver Functions and the Seismic Lithosphere

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The lithosphere is originally defined as a high viscosity zone on top of a low viscosity zone, the asthenosphere. Later many other definitions have been added. Determinations of the thickness of the lithospheric plates which are moving horizontally over thousands of kilometers, is still a highly debated issue. Seismically the asthenosphere is usually associated with a low velocity zone in the uppermost mantle. Therefore locating the lithosphere-asthenosphere boundary (LAB) is even seismically a difficult problem, much more difficult than locating the crust-mantle boundary. Analysis of surface wave dispersion is the traditional seismic technique for determining the lithospheric thickness. Since this is a low resolution technique, it was usually concluded that the LAB is a smooth transition zone. Since more recent times the S receiver function technique has proven to be very useful for identifying the LAB. Application of this technique in many regions of the world is changing our view of the LAB. LAB observations with different seismic techniques in various parts of the world are discussed and compared.