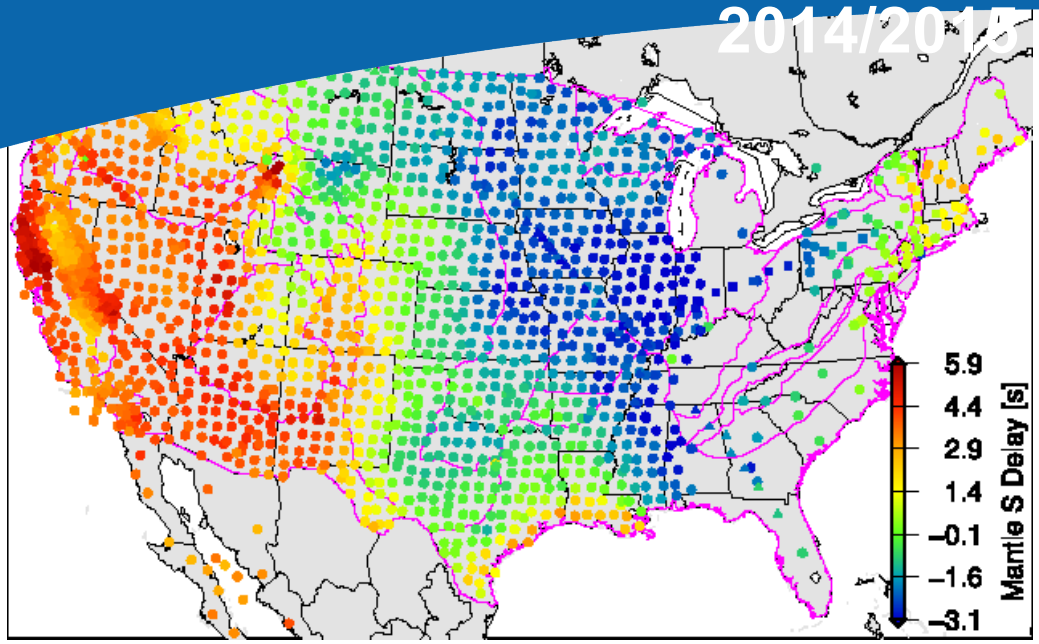
ISTerre
Institut des Sciences de la Terre

Grand Séminaire 2014/2015



A comparison and connection of mantle heterogeneity beneath western and eastern North America

Suzan VAN DER LEE

Northwestern University, Evanston, Etats-Unis

Continent-wide geophysical studies have long pointed out differences between tectonically-active, western and tectonically-stable, central & eastern North America. One well established difference is between the low average upper-mantle seismic velocity of tectonically active North America (taNA) and the high average upper-mantle seismic velocity of tectonically stable North America (tsNA), ascribed predominantly to an upper-mantle temperature contrast of many hundreds of Kelvin. Another such difference is the finer, more abundant detail imaged beneath tectonically active North America (taNA). However, teleseismic delay times recorded by USArray and its predecessor seismic arrays reveal similar diversity in mantle structure beneath the contrasting domains. While prominent surface geology often correlates with clearly anomalous mantle structure in taNA, such correlations are not typical for tsNA. This difference is owed in part to less abundant tsNA data providing reduced resolving power and in another part to the older ages of the Precambrian tsNA geology. To differentiate between these two causes and to address the diversity in tsNA mantle structure, we test existing seismic-tomographic models against two new datasets: 1) teleseismic delay times at arrays of seismic stations east of the Rocky Mountains, and 2) regional wave trains at USArray stations in tsNA from fortuitously contemporaneous earthquakes in tsNA. USArray's Transportable Array's current deployment on the eastern North-American margin will allow further verification or falsification of these results. We conclude by focusing on the Mid-continent Rift System as a particularly prominent geologic feature in tsNA.

Jeudi 9 avril 2015 à 11h

Salle de conférences d'ISTerre

OSUG-C, 1381 rue de la piscine, Campus Universitaire
Arrêt Tram B/C Bibliothèques universitaires