



## The velocity structures under the Trans-Mexican Volcanic Belt: Preliminary results using seismic noise correlation

*Francisco José Chávez García, Ph.D.*

The prediction of seismic movements in the center of Mexico is a matter of great importance, not only for the city of Mexico but also for several other towns in the area. However, the geometry and structure of crustal velocities and the parameters that determine this movement are not known in central Mexico.

This paper investigates the crustal velocity structures in the center of the country using recorded environmental vibration data for three different arrangements, one permanent and two temporary.

The distance between monitoring stations ranges from 3 to 300 km. Seismic noise was analyzed using seismic interferometry to estimate the Green's functions between stations. It was possible to recover only the fundamental mode of the Rayleigh waves of the cross correlation between the vertical component records, in periods ranging from 5 to 10 s. For smaller periods, no correlation was observed between records, even for very nearby stations.

This suggests that the heterogeneity of the Trans-Mexican Volcanic Belt (TVB) prevents the propagation of Rayleigh waves with lengths less than 9 km. We observed a significant velocity contrast between the Guerrero block and the TVB.

This paper presents the first measurements of this contrast, which caused the significant regional amplification observed in the center of the country in 1985; it also explains the appearance of diffracted waves that give origin to the long duration of the seismic movement observed in the Valley of Mexico.

It will be possible, in the second stage of this project, to use data from the RSVM stations recently installed.

The final objective is to propose a model TVB of the structure that can be used to simulate seismic movement in central Mexico that is generated by earthquakes in the subduction zone.