Estimating Shallow Vs-Profiles Using 6C Recordings of Ground Motion

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The combination of rotational and traditional translational motion sensors already proofed to form a new technique in measuring seismic wave field properties. While the estimation of phase velocities of surface waves from regional to teleseismic earthquakes was done both using Love waves and also Rayleigh waves, it was shown just recently that using ambient noise will facilitate the estimation of phase velocity of Love waves by directly relating vertical translational motions to transverse acceleration using a simple plane wave assumption. Up to now, however, in the advent of sensitive, broad band rotational motion sensor these ambient noise based estimates were made only using arrays of traditional seismometer. These array derived rotation estimates on the other hand inherently show sever restrictions especially if the incoming wave field is not strictly planar. Having access to the first highly sensitive and broad-band fibre optic gyro based rotational sensor, we performed several experiments at an active volcano as well as in an urban environment. We here present the result of a joint analysis of phase velocities of Love and Rayleigh waves which than are further combined with a classical H/V estimate in a velocity model for P- and S Waves. The application of this technique using data from a network of 6C sensor will help to increase the reliability of moment tensor inversions at active volcanoes as well as forming an easier to use extension of microzonation in densely populated areas.