



Group Velocity Dispersion Curves from Wigner-Ville Distributions

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With the widespread adoption of ambient noise tomography, and the increasing number of local earthquakes recorded worldwide due to dense seismic networks and many very dense temporary experiments, we consider it worthwhile to evaluate alternative Methods to measure surface wave group velocity dispersions curves. Moreover, the increased computing power of even a simple desktop computer makes it feasible to routinely use methods other than the typically employed multiple filtering technique (MFT). To that end we perform tests with synthetic and observed seismograms using the Wigner-Ville distribution (WVD) frequency time analysis, and compare dispersion curves measured with WVD and MFT with each other. Initial results suggest WVD to be at least as good as MFT at measuring dispersion, albeit at a greater computational expense. We therefore need to investigate if, and under which circumstances, WVD yields better dispersion curves than MFT, before considering routinely applying the method. As both MFT and WVD generally work well for teleseismic events and at longer periods, we explore how well the WVD method performs at shorter periods and for local events with smaller epicentral distances. Such dispersion information could potentially be beneficial for improving velocity structure resolution within the crust.