Ellipticity of Rayleigh waves in basin and hard-rock sites in Northern Italy - supplementary material

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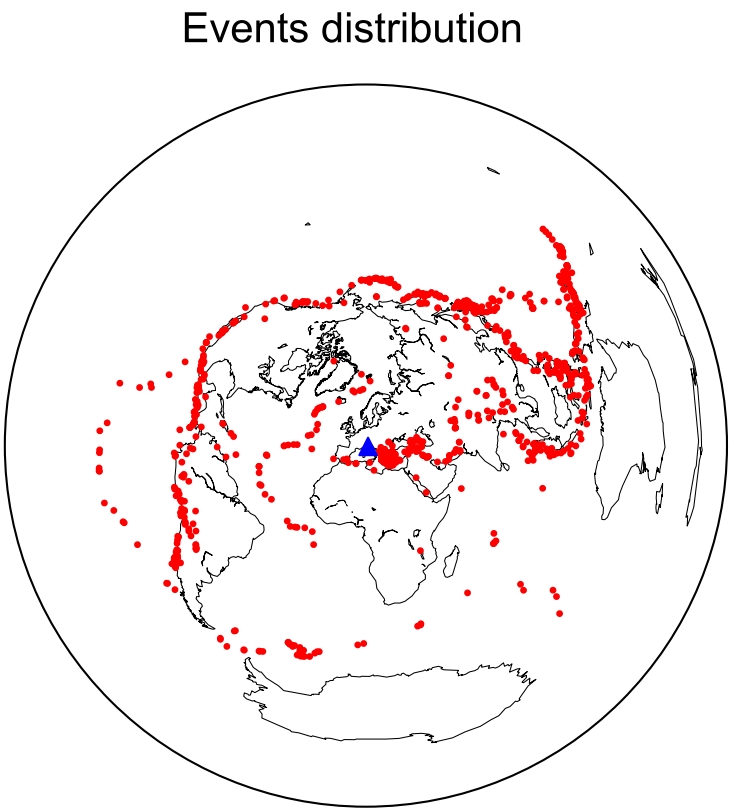
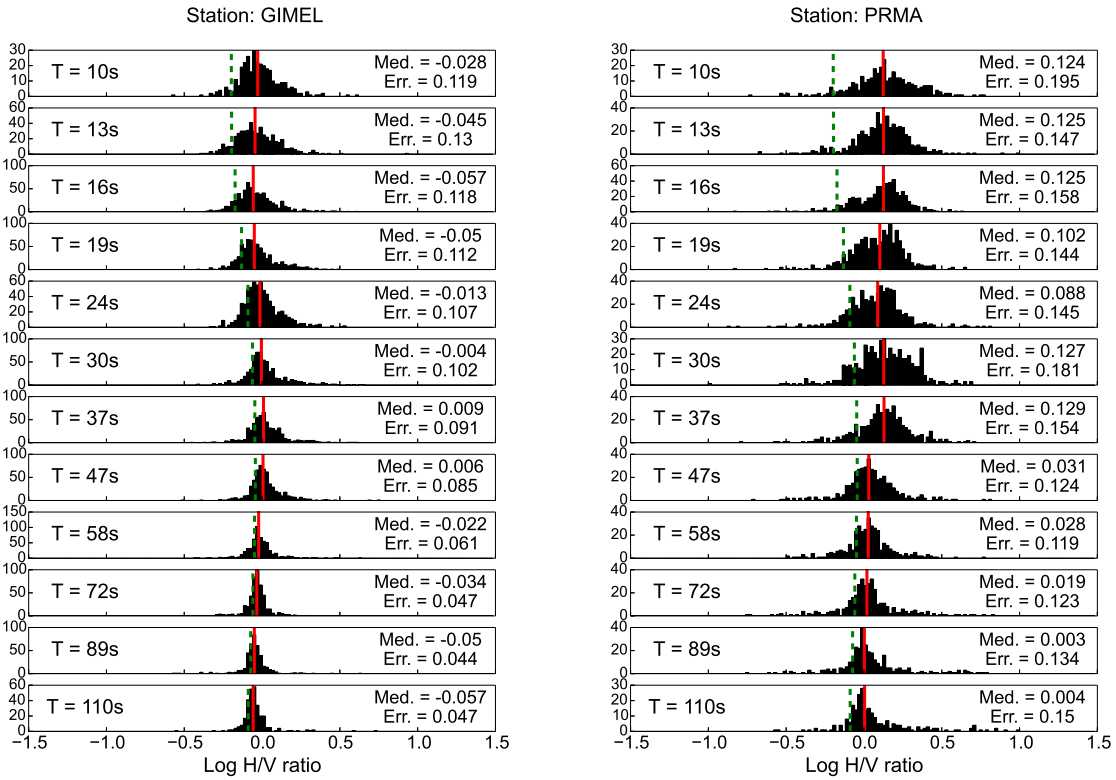


Figure S1: *Distribution of the events database used in this study. We used earthquake with epicentral distance between* 10° *and* 140° *from the stations and* $m_W \geq 5.0$ *occurred from January 2008 to December 2014.*



(a) (b)

Figure S2: *Histograms of ellipticity measurements for station GIMEL (a) and PRMA (b). Red vertical line indicates H/V median, also reported in the labels with the corresponding error. Errors are calculated using the percentiles corresponding to* 15.9 *and* 84.1. *Green dashed line is the ellipticity calculated on Prem reference model.*

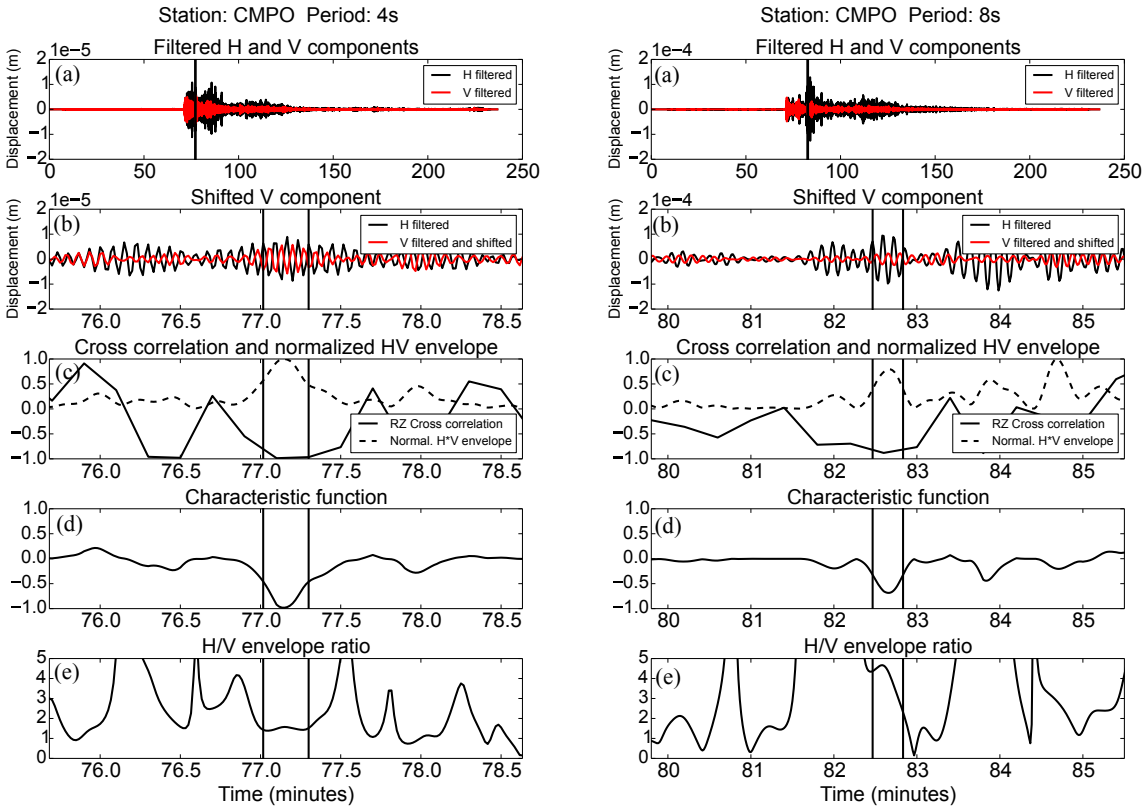


Figure S3: *Measurement scheme for the March 11 2011 earthquake in the Tohoku region (Japan) (origin time: 05:46:23.00 UTC, mw = 9.0) recorded at the station CMPO at a period of 4s (left) and 8s(right). (a) Full waveforms filtered with a narrow Butterworth-Bandpass filter. Vertical component is plotted in red, horizontal (radial) component is plotted in black. (b) Zoom of the waveform. The phase ov the vertical component has been advanced by* 90 deg*, as expected for "normal" polarity, i.e. retrograde elliptical particle motion. Horizontal and vertical components result here anti-correlated. (c) Cross-correlation between the de-phased vertical component and horizontal component (solid line) and normalized envelope of horizontal times vertical components. Negative cross-correlation indicates a prograde polarization of Raileigh waves. (d) Characteristic function, defined as the product of envelope and cross-correlation. (e) H/V ratio between the envelopes of horizontal and vertical component.*

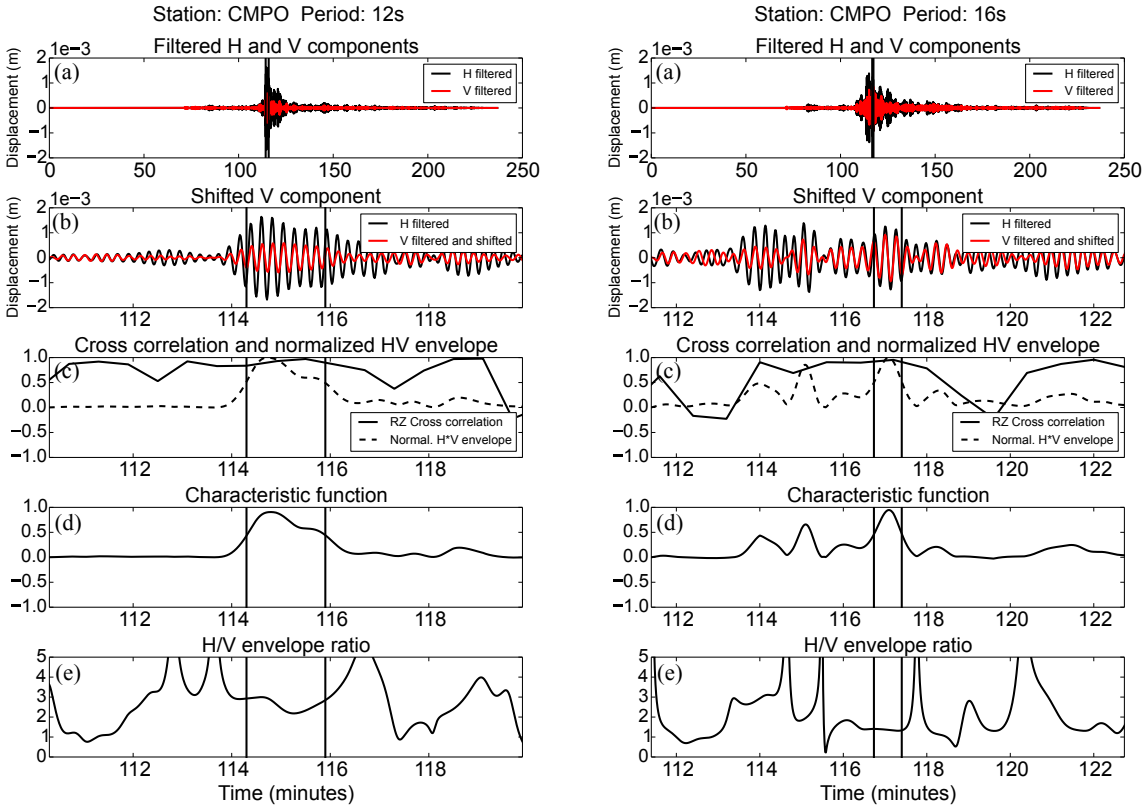


Figure S4: *Same as in Figure S3, but for signal filtered at longer periods (12s and 16s). At these frequencies, the same phase shift brings the horizontal and vertical components in phase, and cross-correlation is positive, as expected for 'normal', retrograde-motion polarisation.*