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# Examining ambient noise using co-located measurements of rotational and translational motion

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In the past decade a number of studies have reported the observation of rotational motion associated with seismic events. We report a first observation of rotational motion in the microseismic ambient noise band. A striking feature of rotational motion measurements is that the information about the seismic phase velocity and source backazimuth is contained in the amplitude ratio of a point measurement of rotation rate and transverse acceleration. We investigate the possibility of applying this method to ambient noise measured with a ring laser and a broadband seismometer at the Wettzell geodetic observatory in Germany. Using data in the secondary microseismic band, we recover local phase velocities as well as the backazimuth of the strongest noise source for two different time periods. In order to confirm these findings we additionally compare the results with classical array processing techniques of the nearby located Gräfenberg array.