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Relation between rotational seismic measurements and events' source properties using the LSBB dense seismic array.

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Ground motions generated by earthquakes have for a long time been addressed by measuring the translational ground motions and used to determine earthquakes source characteristics. Rotational seismology is a relatively new field of studies and recently, portable sensors have begun to be sensitive enough to directly measure seismic rotations. Nevertheless seismic rotations remain computable using the spatial finite differences of the local ground motions. Finite difference method was applied in order to derive the rotations from seismograms recorded by the dense broadband seismic array of the LSBB (Low background noise underground research Laboratory, France, http://lsbb.eu). This array is composed of a dozen 3-component translational broadband sensors distributed over a 2.5 km2 area. Several seismic events with a moment magnitude Mw $\geq$ 5 were selected from a moment tensor catalog for an entire year. For each event, the rotational motions were systematically quantified and analyzed. Preliminary conclusions on the relation between rotational measurements and sources' properties are discussed.