



Measurement of the 3-component rotational motion induced by the Norcia earthquake (30/10/2016), Italy, with the prototype portable 3-component rotational blueSeis-3A-sensor at the LSBB Underground Research Laboratory, Rustrel, France

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The Ixblue company installed in the gallery of the Low background Noise underground research Laboratory (LSBB, Rustrel, France), a prototype of the new portable 3-component rotational blueSeis-3A-sensor during 1 month, from the 28 October 2016 until the 17 November 2016. The purpose of this experiment was to demonstrate the ability of this new sensor to record seismic rotational signal on field condition, and to compare it to ADR (Array derived Rotation). To this end, the LSBB underground permanent seismic network has been completed by 5 additional temporary broad band stations. Thanks to this dense small-aperture seismic network, the vertical and horizontal rotation motions have been estimated based on array finite difference approximation of the spatial derivatives of the local ground motion. In the morning of the 30 October 2016, a magnitude 6.6 earthquake severely hit the region of Norcia, Central Italy, at 7h40 local time. Located at less than 650 km away for the LSBB, the event was clearly recorded by the 3A-sensor and all broad band seismometers with a high signal to noise ratio. The comparison of the array derived rotation with direct observations done by the 3A-sensor demonstrates the capacity of the prototype portable blueSeis-3A, 3 component instrument, to measure ground rotational motion with an amplitude lower than $1 \times 10^{-7} \text{ rad} \times \text{s}^{-1}$ on a frequency band from 0.02Hz to 0.33Hz.