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Tilt removal on 6-axis ground motion measurements: experiments at iXblue

Guillaume Lenogue¹, Baptiste Pinot², Frederic Guattari¹, and David Mimoun²

¹iXblue, Saint-Germain en Laye, France

²ISAE SUPAERO, Toulouse, France

The recent development of rotational sensors of increased sensitivity and portability allowed for co-located 6-axis seismological measurements. This opens new possibilities for the study of seismic records. For example, back-azimuth can be computed with a single station horizontal axis rotations. One of the most promising developments is the ability to remove the projection of the gravitational acceleration on the horizontal translation directions in case of tilting of the sensor assembly, which was formerly indistinguishable from a true acceleration.

A 6-C experiment was conducted at a testing facility at iXblue Saint-Germain-en-Laye, France. Different data processing algorithms for tilt removal, as well as a new algorithm developed for this study (whose mathematical basis will be detailed in another submitted abstract) have been applied to this experiment and their results were compared. Contrary to field measurements, tests in laboratory allowed to test edge cases of the different methods.