

Interactive comment on “Influence of high-latitude geomagnetic pulsations on recordings of broad-band force-balanced seismic sensors” by E. Kozlovskaya and A. Kozlovsky

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The paper addresses a relevant issue on the influence of earth magnetic field transients on records of broad-band seismometers. This effect was reported previously in the literature. In this paper the authors emphasize the influence of magnetic pulsations at high latitudes and, in addition of possible explanations of this effect proposed in the literature so far, the authors suggest another physical mechanism for the frequency-dependent magnetic field coupling with seismometers. As a significant example, they show the influence of these disturbances on glacial earthquakes record. The point is important given the number of broad-band seismic stations deployed in the last few

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years in Polar Regions.

The matter is indeed relevant for the scope of GI.

Methods used are well known, not new. Relevant previous works are cited and discussed. The most complete papers on the subject by Forbriger (2007) and Forbriger et al. (2010) made a broad study on the earth magnetic field on BB seismometers. The present paper considers especially the effect of magnetic pulsations and finds a frequency dependence of coupling.

The proposed mechanism of frequency-dependent coupling may be especially possible in the case of sensor STS-2, where the feedback coil is driven through passive components: an induced emf by magnetic flux variations may simply produce a stray current –and therefore a feedback force- “interpreted” by the instrument as ground acceleration. I might suggest another possible mechanism for this coupling in due course along the discussion.

Although clear results are presented, they may not be representative of the general influence of magnetic disturbances on BB seismometers, because only two seismic stations were used with particular installations conditions (e.g. steel reinforced concrete, not recommended for these instruments and –as far as I know- unusual). As the authors acknowledge, the magnetic coupling may be quite dependent on the instrument and particular installation. A similar problem is found with the influence of barometric-induced tilt noise on BB seismometers.

A few technical corrections suggested: - Figure 2 top panel is labeled “. . .(decimation 150s)”, but according to the figure caption, the data were low-pass filtered at period 150s, so the label seems to be wrong or otherwise the signal would be aliased. Presumably, the authors may want to say in the label “ (low-pass filtered at 150s)”.

- Faraday “low” should be Faraday law at line 7 of page 115.

- Typing error on “Ekström “ on line 22, page 118.

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