

SEM031-04

Room: 301B

Time: May 26 16:15-16:30

On the upper limit of in situ piezomagnetic stress sensitivity in the Earth's crust, revisited

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In an earlier study, the authors attempted to provide an upper limit of the piezomagnetic stress sensitivity, i.e. the proportional coefficient between mechanical stresses and changes in magnetization, by means of comparisons between data and simulation for the case of the 2007 Noto Earthquake [Yamazaki et al., 2009, IAGA]. They concluded that in-situ stress sensitivity is up to $2 \times 10^{23} \text{MPa}^{-1}$. However, their simulation involves some of unacceptable assumptions so that the claimed conclusion is not fully assured. To deal the problem with a reliable way, we perform a series of simulations. Spatial distributions of magnetizations in the realistic Earth's crust are properly considered in these simulations, making it possible to obtain a more accurate estimation of the piezomagnetic stress sensitivity.

Keywords: co-seismic magnetic change, piezomagnetic effect, stress sensitivity, 2007 Noto Earthquake