

EGU21-12859, updated on 01 Dec 2021
<https://doi.org/10.5194/egusphere-egu21-12859>
EGU General Assembly 2021
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Reliability tests of moment tensor inversion of anthropogenic seismicity

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Seismic moment tensor becomes part of basic seismic data processing. For anthropogenic events mostly common and available method to determine mechanism is amplitude inversion. However essential for correct amplitude inversion are good quality data. Factors commonly occurring in anthropogenic seismicity like high noise to signal ratio, low magnitude and shortage of seismic stations with unfavorable focal coverage can introduce undetected errors to inversion solution. In this work, synthetic tests for two seismic networks are presented to examine the reliability of P-wave first peak amplitude inversion for these areas. The synthetic tests of the noise influence on the results of full MT solutions were carried out for two surface networks monitoring anthropogenic seismicity: VERIS network in Vietnam and LUMINEOS network in Poland. Various mechanisms with double couple component variability from 10% to 100% were considered to take into account mechanisms caused by different types of human activity. High variability of solutions in tests shows that some spurious components cannot be avoided in full moment tensor solutions obtained for presented networks in certain cases.

This work was partially supported by research project no. 2017/27/B/ST10/01267, funded by the National Science Centre, Poland, under agreement no. UMO-2017/27/B/ST10/01267.