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and Issues of Applying Machine Learning Based Denoising on Inversions of the Democratic People's Republic of Korea Nuclear Tests

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We apply a current state-of-the-art machine learning based denoising algorithm on the seismological and hydroacoustic waveform records of the selected Democratic People's Republic of Korea nuclear tests. We use the DeepDenoiser algorithm to reduce the noise present in the waveform records of the larger Democratic People's Republic of Korea nuclear tests. The denoising of waveform records using machine learning has obvious advantages on the picking of phases and signal detection but the question is if the currently available techniques can be used beyond that. We investigate the impact the denoising has on the source mechanism inferences by comparing the seismic moment tensor inversion results of original and denoised data. Because of the good signal to noise ratio and as the source type is well known we can in this case establish if the denoised waveforms can be used for further source analysis. We find that care needs to be taken using the modified waveform data but also find promising results hinting at possible further use of the technique in the future for standard analyses. We further investigate if the application of the chosen denoising algorithm allows for the better resolution of the seismic moment tensor of the smaller Democratic People's Republic of Korea nuclear tests.

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Promotional text

Seismic moment tensors of the DPRK nuclear tests are performed on Machine learning based denoised waveform records

Oral preference format

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