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Gravity Gradient Noise Mitigation using Deep Learning

The Einstein Telescope aims to improve sensitivity by at least an order of magnitude compared to current detectors. The dominant noise source in the region of 1 to 10 Hz is expected to be Newtonian Noise (NN) from seismic activity in the surrounding rock. In order to reach the desired sensitivity, NN must be actively mitigated. Seismometers will be installed in boreholes around the mirrors to measure the seismic activity. The current standard method to predict the mirror response from seismometer measurements is the application of linear filters. We propose a neural network architecture to estimate the mirror response from seismometer readings. We find, that this approach delivers improved results.

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