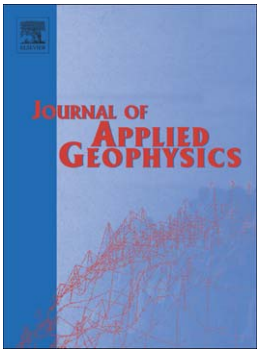

Robust noise attenuation based on nuclear norm minimization and a trace prediction strategy

Yatong Zhou, Shili Zhang

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Robust noise attenuation based on nuclear norm minimization and a trace prediction strategy

Yatong Zhou and Shili Zhang

[1] *School of Electronic and Information Engineering*

Hebei University of Technology

Xiping Road No. 5340, Beichen District

Tianjin, China, 300401

zyt_htu@126.com

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Running head: **Robust noise attenuation based on NNM**

ABSTRACT

Rejecting noise in seismic data while not affecting the amplitude of useful signals is a long standing problem in seismic data processing. Seismic noise attenuation can be formulated as a nuclear norm minimization (NNM) problem. To meet the assumption that seismic data should have low nuclear norm, we first map the seismic data into a low-rank matrix based on a trace prediction strategy. We provide detailed algorithm workflow and mathematical analysis of the trace prediction method. The seismic data after trace rearrangement is demonstrated to be locally low-rank. The NNM problem is then solved via the singular value thresholding (SVT) algorithm. The effectiveness of the proposed method is validated via both synthetic and field data examples. We also test the robustness of the proposed method with respect to random noise, spiky noise, and blending interference. Compared with the state-of-the-art predictive filtering method, median filtering method, singular spec-