

Filtering wind noise in seismic and infrasonic data by Non-negative Matrix Factorization: methodology and case studies

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Non-negative Matrix Factorization (NMF) is being applied to an increasing number of different fields, including volcanic geophysical signals. In fact, volcanic tremor and infrasonic signals recorded close to volcanoes often result from the superposition of signals with very different origin, ranging from natural to anthropogenic. In this work we propose a framework where NMF is applied to the separation of such a mixture of foreground / interesting / target "signals" from background / interference / undesired "noise". Case studies presented here focus on the problem of separating seismic and infrasonic signals of volcanic origin from wind noise when only a single station is available, a common situation especially when monitoring remote volcanoes. Examples will be shown from Villarrica volcano in Chile and Mt. Shinmoe-dake, Kirishima in Japan.