



Cross correlation analysis of ambient noise recorded in the Caribbean Netherlands to monitor volcanoes The Quill and Mt. Scenery

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Since 2006, KNMI deploys a broad-band seismic network in the Caribbean Netherlands to monitor the volcanoes The Quill on St. Eustatius and Mt. Scenery on Saba, both on the inner Leeward island arc which hosts active volcanoes. This network is complemented by a broadband sensor on St. Maarten, located in the outer Leeward island arc on the remains of an extinct volcano.

Seismic ambient noise cross correlation is increasingly used to monitor volcanic activity, in particular for large and dense networks of broadband stations. The application of the correlation technique on cross components of a single-station is being investigated recently as a promising, alternative technique for forecasting volcanic activity using a single 3 component seismic sensor only.

Data from our network go back to 2006, with one seismometer on each volcano. In 2014-2015 three additional seismometers were installed on each island. We compare both types (cross station and cross components) of correlations within our network, and apply the single station technique to data from 2006 and onwards. The remarkable similarities in the results obtained by the different types of correlations in the 1-2 Hz frequency band open new perspectives to successfully monitoring volcanic activity at sparsely equipped volcanoes. Also we correlate results from 2016-2018 with various meteorological parameters (e.g. atmospheric pressure, wind direction) to better understand the temporal variations of the cross correlations. Finally, we compare the single station cross component correlation results obtained from 12 years of data from two active volcanoes to those from an extinct volcano in the same region.