# Detecting Meteorological Events in the GNSS IWV Time Series of the NERC British Isles continuous GNSS Facility (BIGF) network

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In this research, the Integrated Water Vapour (IWV) time series from GNSS analysis of the NERC British Isles continuous GNSS Facility (BIGF) network was used to detect meteorological events. The main frequencies of the IWV time series were analysed spatially to capture the spatial dependency across the network using a spatial autoregressive model, and the high-frequency components were analysed temporally, using an Artificial Neural Network (ANN) to capture the temporal dependency at a station. A combination of these two analyses was then applied to capture any dependency in both time and space domains. The results were cross-validated using MIDAS datasets. The proposed approach shows the ability to detect the times and locations of low water vapour as well as high water vapour which corresponds to large-scale events like thunderstorms and heavy rains. The proposed approach was also able to show the water vapour developing and building up in both time and space. The results show that longer period events were detected by the spatial analysis algorithm while events which are larger in area and more dynamic were detected by the temporal analysis algorithm. More localised events were then detected by a combination of the analysis algorithms.