

## 13.40 OPEN SOURCE POLARIMETRIC RADAR AND WEATHER STATION DATA USING PYTHON

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Precipitation measurements with polarimetric radar have become very popular over the last decade with many countries moving from traditional Doppler radars to these new radar systems. Polarimetric weather radar offers a wealth of additional information that was not available before. Many countries also make the measured data freely available in open data projects. This makes progress in research much easier.

A logical problem when comparing different techniques is often that research is performed using local data. This means that data can be gathered with different types of radar and in different climates. What is presented here is the goal of setting up a more universal code and dataset(s) using open source data, where researchers can contribute to by adding their own code for processing their own local radar and weather data. This can then be added to an larger dataset. This should make research both easier to set up as well as compare to work of others.

The initial setup of the code is based on data gathered by the polarimetric weather radars operated by KNMI, The Netherlands, that have been fully operational since 2017. The radar data as well as many other measurements and model data are available as open data provided by KNMI at [data.knmi.nl](http://data.knmi.nl).

The dataset that is created in the first stage will contain simple point data at measurement locations. While the inclusion of the full radar scans can provide very useful and interesting additional information the goal is also to keep the dataset simple and small. The code used to create the dataset will be made available to make it easy to include additional data if desired.

While there many weather stations in the Netherlands they do not all report the same amount weather elements. Of these stations 25 have been selected that also report present weather (SYNOP ww-code). Radar data at and near the location of the weather stations will be included in the dataset.

The usefulness of the dataset will be demonstrated by using several neural network variants to derive precipitation type and clutter from the data. The sensitivity of the neural networks to different inputs will be tested. Future plans include the addition of weather data from other countries that provide open data and extending the Dutch part of the dataset with a longer time period, as well as additional sources like model data and Meteosat based products.

Code written to extract and process the data from KNMI as well as the code to estimate precipitation type using a neural network are written in Python. The data and code will be made available in Github, so that researchers and students can easily test the source and contribute.

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