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JOYCE-CF – Jülich Observatory for Cloud Evolution. A core facility for long-term cloud and precipitation observations

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The synchronous observation of atmospheric parameters using different observation systems has led to the installation of several so-called „supersites“, both around the globe and within Germany. At JOYCE-CF (Jülich Observatory for Cloud Evolution – Core Facility) a suite of ground-based remote sensing instruments has been installed in the last decade for the detailed observation of cloud and precipitation processes.
JOYCE-CF is a cooperation of the Universities of Bonn and Cologne and the Research Center Jülich and has recently been promoted as a Core Facility by the Deutsche Forschungsgemeinschaft (DFG). The unique capacities of JOYCE-CF lie in multi-frequency radar observations, both scanning and vertically pointing. Two scanning polarimetric X-Band radars are operated at Bonn (BoXPol) and Sophienhöhe near Jülich (JuXPol) and a suite of cloud radars (Ka, W-Band) is located at the Research Center Jülich (JuCol), where all the instruments are installed which perform mostly vertically pointing observations.
Another focus of JOYCE-CF is to serve as a best practice center for the operation of ground-based passive microwave radiometers within networks on a European scale. This center is foreseen to serve the international community via the European research infrastructure project ACTRIS.
With the instrumentation installed at JOYCE-CF, it is not only possible to study cloud and precipitation processes in detail on both macro- and microphysical scales, but also the general development of the atmosphere in terms of wind profiles, boundary layer structure and surface energy balance. The continuous, long-term observations allow to perform climatic studies on the structure of clouds and precipitation and in future probably also to detect climate trends. In addition to these standard observations, targeted measurement campaigns are regularly performed at JOYCE-CF.
We will present the instrumentation of JOYCE-CF as well as some long-term data series and observation highlights.