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Doppler Cloud Radar : RPG operation guidelines

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CCRES Workshop, online – June 11th, 2024

This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreements No 871115

Doppler Cloud Radar : RPG operation guidelines

RPG (Radiometer Physics) - Germany

Many information in the RPG operation and software manual

RPG cloud radar training

Article: "A W-band Radar-Radiometer System for Accurate and Continuous Monitoring of Clouds and Precipitation" authored by Nils Kuchler, Stefan Kneifel, Ulrich Lohnert, Pavlos Kollias, Harald Czekala, and Thomas Rose (JTECH, 34, 2375-2392)

Delft University of Technology – The Netherlands

2 technical reports:

Report 1: Horizontal Wind Plan Position Indicator (PPI) Measurement conducted by RPG radars within the EarthCARE/Cal Val Framework authored by Christine Unal

Report 2: RPG Frequency Modulated Continuous Wave (FMCW) Cloud Radar Triggered Measurement Batch Files (MBF's) authored by Rob Mackenzie

Report 1: Horizontal Wind Plan Position Indicator Measurement conducted by RPG radars

Guidelines for azimuthal scan to get a vertical profile of the horizontal wind and the vertical Doppler velocity.

Specifications for azimuthal scan at 35 and 94 GHz

Example of chirp tables at 94 and 35 GHz with some discussion about the meaning of the parameters in the chirp table.

For the retrieval technique

“Combined wind lidar and cloud radar for high-resolution wind profiling" authored by José Dias Neto, Louise Nuijens, Christine Unal, and Steven Knoop (Earth Syst. Sci. Data, 15, 769–789, 2023).

https://github.com/jdiasn/lidarwind

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Report 1: Horizontal Wind Plan Position Indicator Measurement conducted by RPG radars

Guidelines for azimuthal scan to get a vertical profile of the horizontal wind and the vertical Doppler velocity.

Good to know:

Dual frequency RPG → use the 35 GHz because the maximum Doppler velocity measurable is about 3 times larger than the 94 GHz one. We use the elevation 75°.

RPG 94 GHz → use a high elevation angle to decrease the horizontal wind component. We propose 85° elevation.

The RPG radar scans in azimuth rather slowly (max: 5° per s) → full PPI in 72 s

Further the radar scans clockwise from 0° to 359.9° and must perform afterwards a counterclockwise rotation from 359.9° to 0°.

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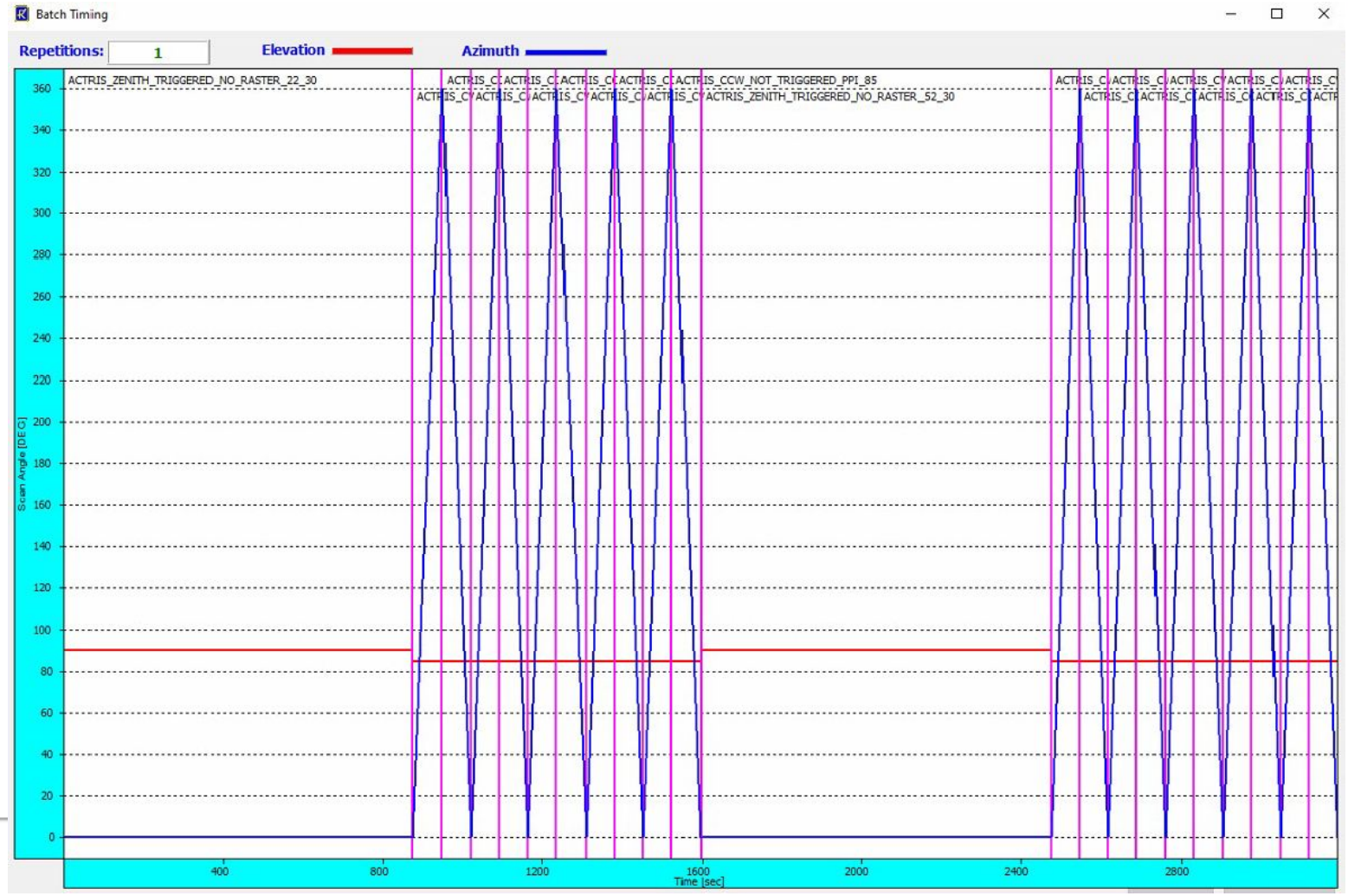
Report 2: RPG FMCW Cloud Radar MBF's

The manual describes how to define the Measurement Definition Files (MDF's) and Measurement Batch Files (MBF's) required to achieved triggered measurements using the RPG host computer software.

Example of Measurement Batch File



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Thank you