Observations of precipitation profiles and microphysical analysis during LIAISE

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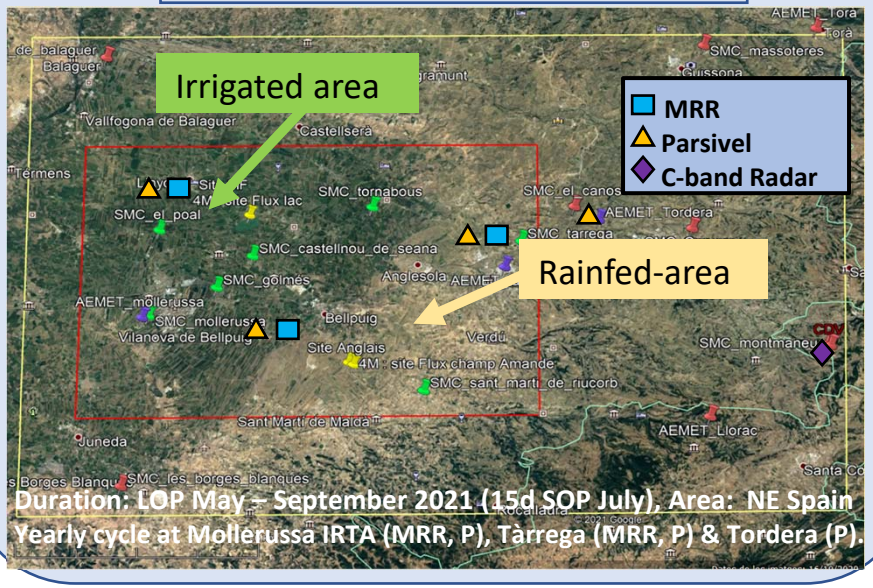
1. Objectives

Impact of surface (**irrigated** vs **rainfed** only **areas**) and low level atmospheric conditions upon precipitation processes (**frequency**, **intensity**, **stratiform** vs **convective** regime, precipitation microphysics dominant processes, etc.).

- *At **seasonal** temporal scale (**subdaily** patterns at **Δt ~1h, Δx ~1 km** over the **LIAISE** region of study) – **existing** data sets.*
- *At individual **event scale** - analysis of high resolution precipitation profiles (**Δt ~1min, Δz ~100 m, 3 to 6 km AGL**).*

Importance for process studies and remote sensing of precipitation, both ground-based (C-band Doppler **weather radar**, **MRR profiler**, **disdrometer, raingauge**) and spaceborne precipitation estimates.

2. LIAISE-2021 Field Campaign



3. Methodology / Tasks

- C-band radar reflectivity (6 min temporal resolution) rainfall type (convective and non-convective) and derived amount (Powell et al 2016). ***Method implemented and data acquired; processing pending.***
- MRR & disdrometer LIAISE field campaign data statistical analysis: ***Started; some sites pending.***
- MRR (K-band) profiles and disdrometer data (1 min) for microphysical process analysis: precip. Type & Bright band analysis (García-Benadí et al 2020, 2021). ***New method on BB for MRR-Pro; fine tuning and application to MRR2 observations pending; case studies (virga, etc) selection pending (W band radar useful).***
- Comparison of radar reflectivity from C-band weather radar and MRR units. ***Under development.***

Garcia-Benadi A, Bech J, Gonzalez S, Udina M, Codina B, Georgis JF 2020: Precipitation type classification of micro rain radar data using an improved Doppler spectral processing methodology. Remote Sensing, 12(24), 4113.
Garcia-Benadí A, Bech J, Gonzalez S, Udina M, Codina B 2021: A New Methodology to Characterise the Radar Bright Band Using Doppler Spectral Moments from Vertically Pointing Radar Observations. Remote Sensing, 13(21), 4323.
Powell SW, Houze RA, Brodzik SR 2016: Rainfall-type categorization of radar echoes using polar coordinate reflectivity data. J Atmos and Oceanic Technol, 33(3), 523-538.

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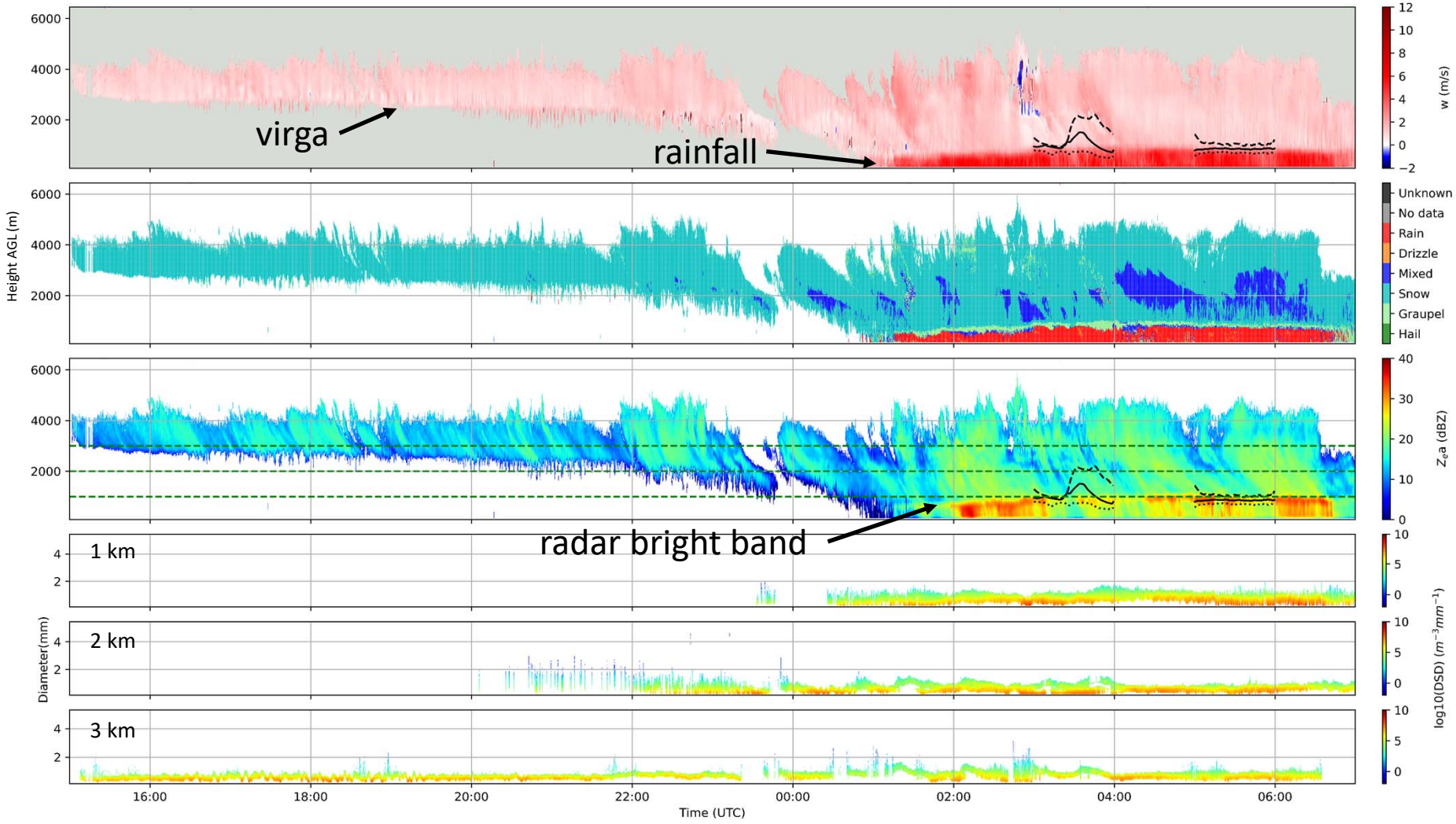
4. Preliminary Results: Filomena Storm (9-10 Jan 2021) Virga case



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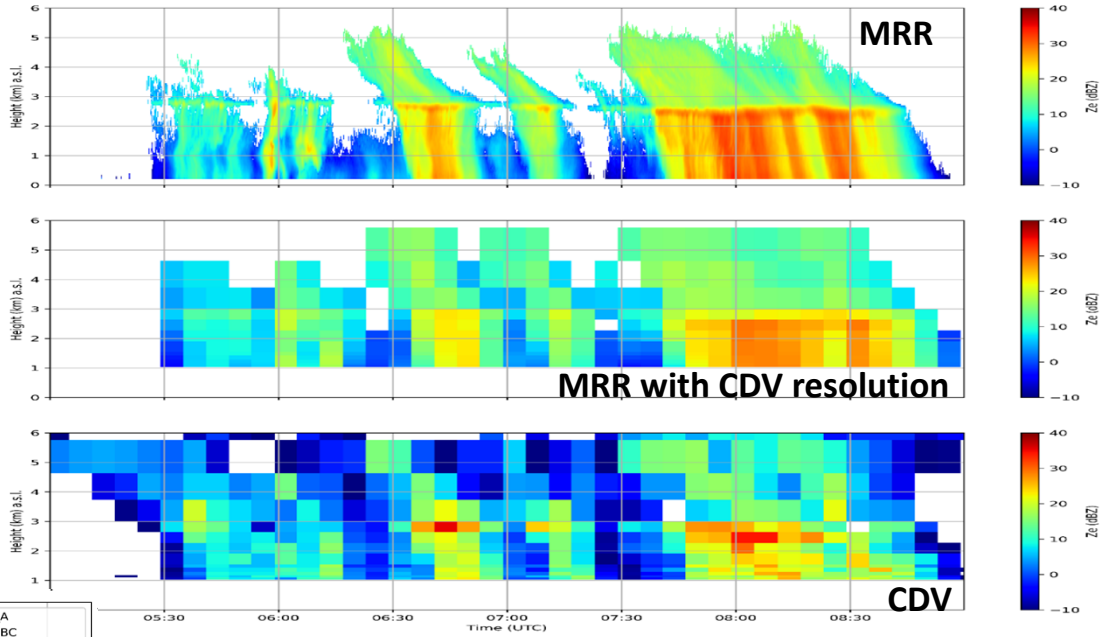
4. Preliminary Results: comparison of MRR vs C-band CDV radar Z

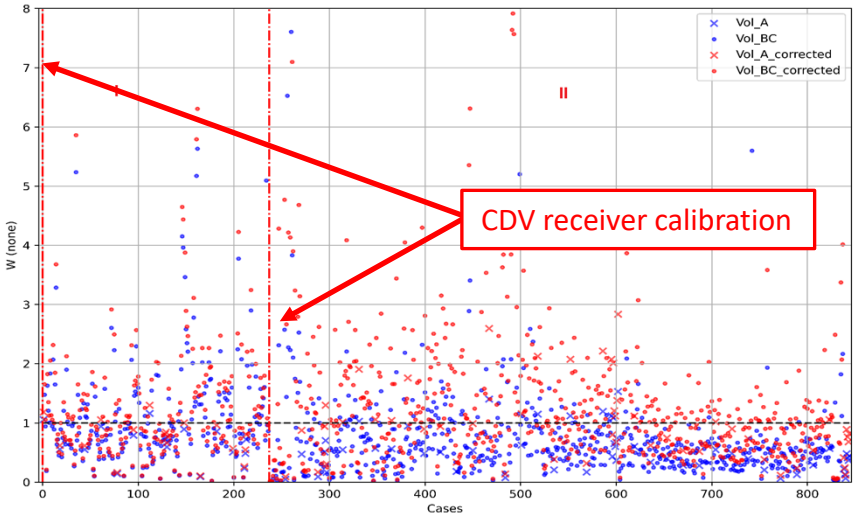
a. Calibration of MRR-Pro with rain-gauge (XEMA):

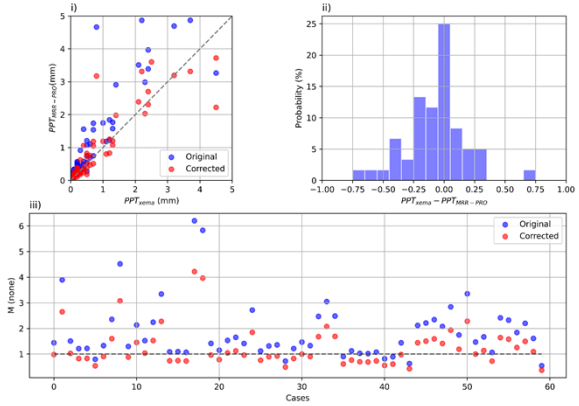
$$M = \frac{PPT_{MRR-Pro}}{PPT_{xema}}$$

b. Correction of XRAD radar (CDV) with MRR-Pro:

$$W = \frac{Ze_{XRAD}}{Ze_{MRR-Pro}}$$







Acknowledgements

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