Unravel the contribution of different frequency PMW-channels during rainfall events.

Aim: to explore this contribution even further by taking into account the weather type.

Study area and period:

Overpasses of GPM constellation conical scanners during 2019 over the Netherlands.

<u>Satellite observations:</u>
GPROF precipitation estimates.
Level 1 brightness temperatures.

<u>Ground-based radar:</u>
Gauge-adjusted radar estimates.
Radar reflectivities.

Study outline:

Step 1
Match footprint of conical sensors with ground-based radar grid

Step 2
Regress brightness temperatures against reference precipitation estimates

Step 3a
Is their any weather-type dependency?

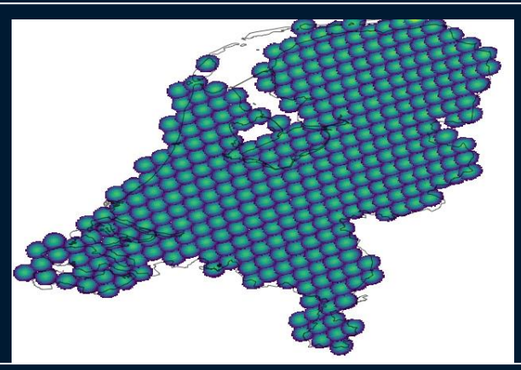
Step 3b
Select overpasses to study in depth with profiles (cases)

Matching:

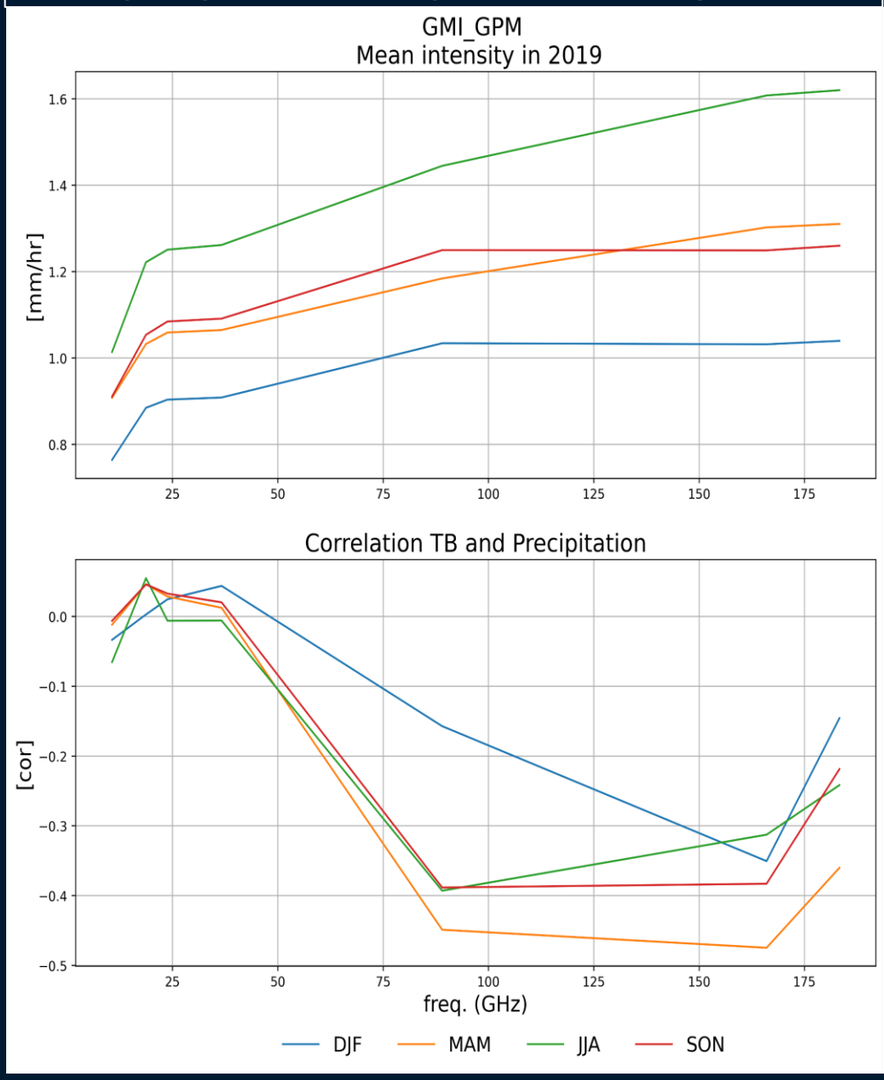
Gaussian weighted ellipses.

Footprint specifications are frequency dependent.

Example simulated footprints:



Preliminary results overpasses GMI over the Netherlands in 2019 (intensity is the reference precipitation resampled at GMI footprint)



AGU poster session 2021

Linda Bogerd, PhD candidate (Wageningen University and Research, The Netherlands). Linda.Bogerd@wur.nl
Supervisors: Hidde Leijnse, Aart Overeem, Remko Uijlenhoet

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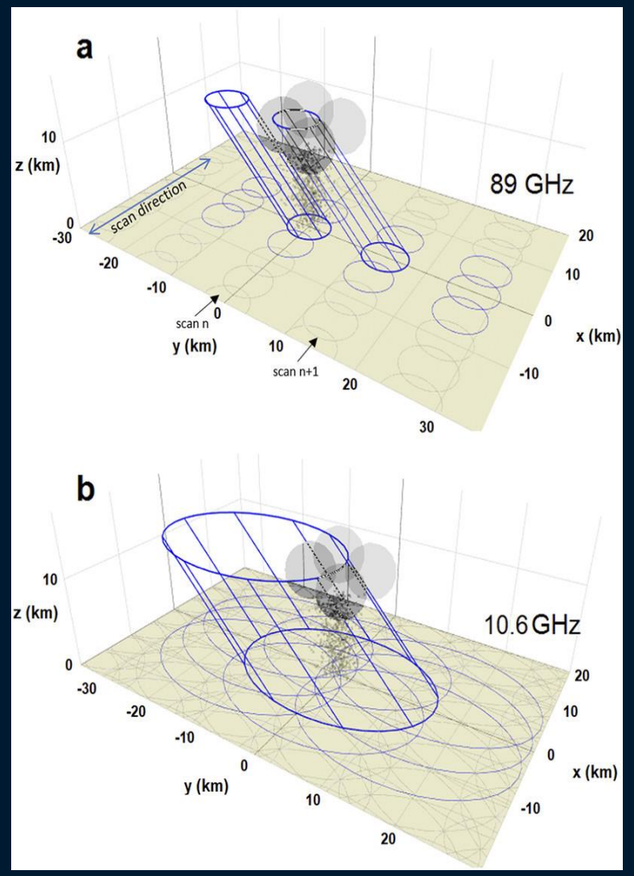
First, one step back: how do different footprint sizes and the way of coupling affect the satellite observations

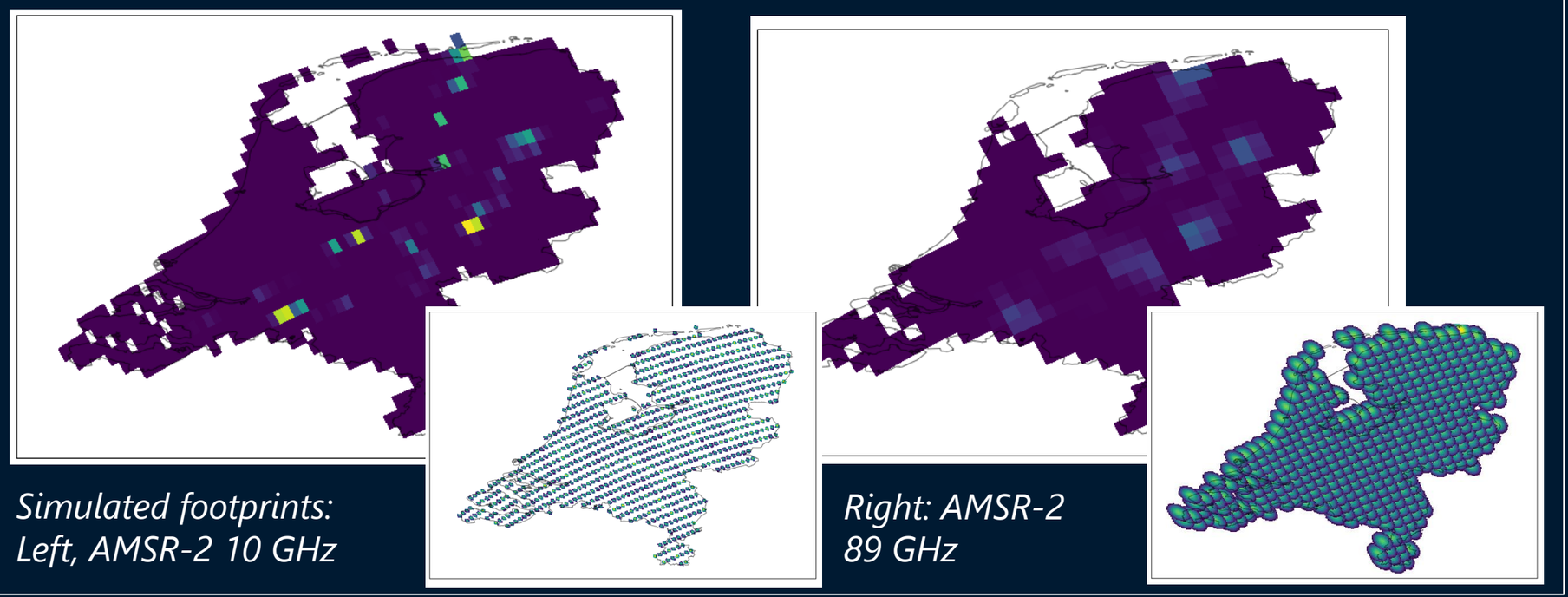
Aim: *to unravel how different footprint sizes and way of matching a ground-based profile affect GPROF its performance statistics.*

Study outline:

Study area, period and data:	Step 1 (same)	Step 2	Step 3	Step 4
Same	Match footprint of conical sensors with ground-based radar grid	Quantify effect footprint size on reference precipitation estimate	Validate use of ground-based radar: compare profiles of ground- vs satellite-based radar	Compare coupling slanted and straight vertical radar profile.



Example of effect footprint size on intensity reference precipitation estimates (AMSR-2)



Simulated footprints: Left, AMSR-2 10 GHz

Right: AMSR-2 89 GHz

Illustration step 4

Retrieved from C. GUILLOTEAU and E. FOUFOULA-GEORGIOU (2019). *Beyond the Pixel: Using Patterns and Multiscale Spatial Information to Improve the Retrieval of Precipitation from Spaceborne Passive Microwave Imagers*

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