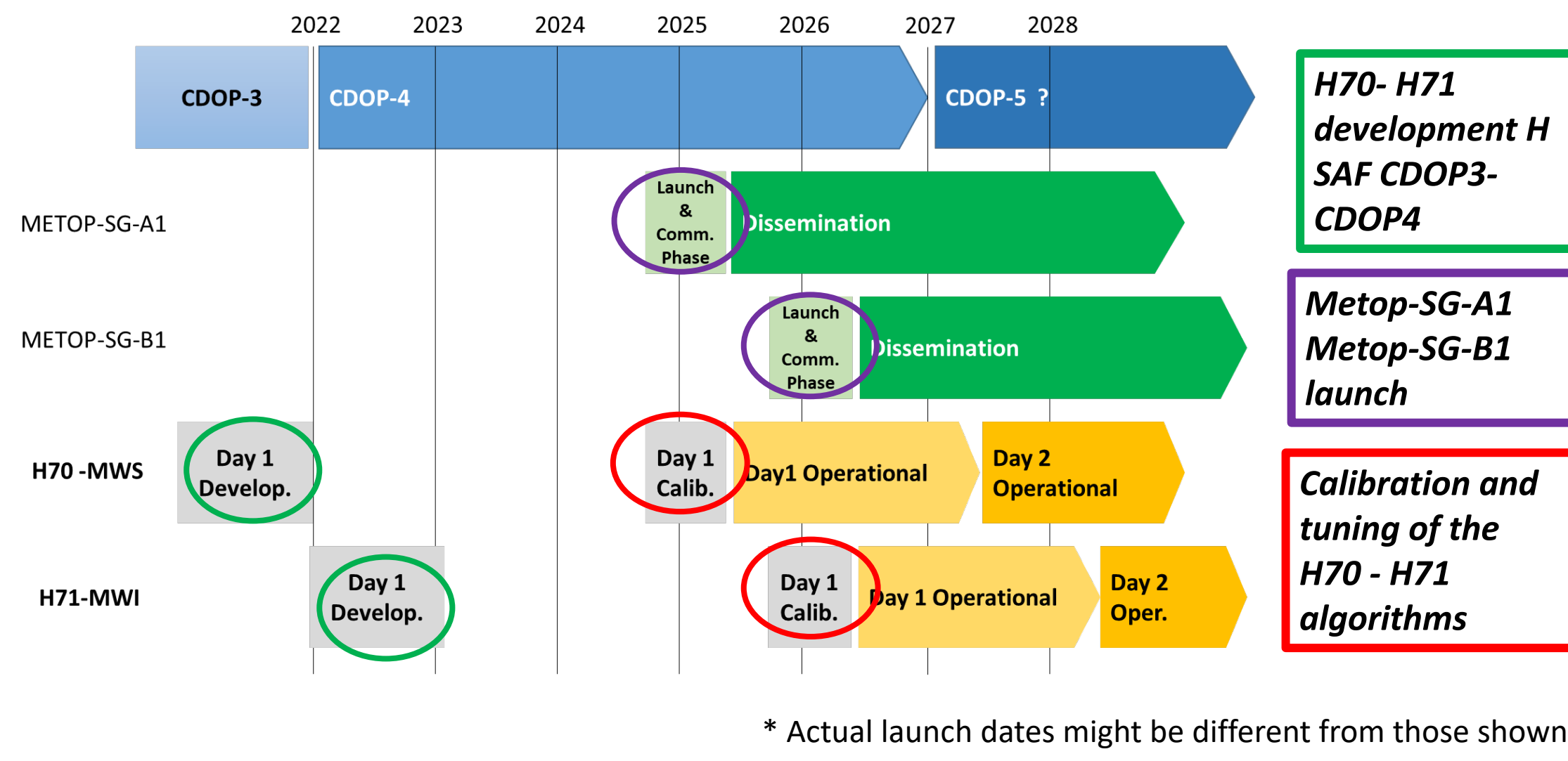


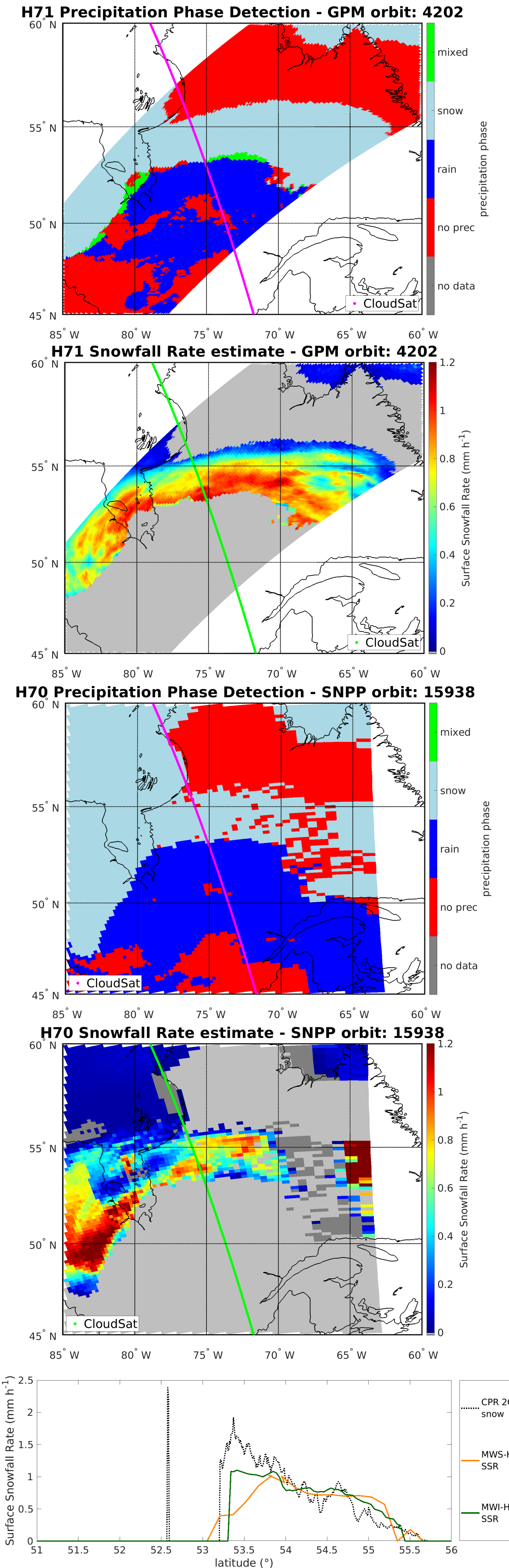
1. Introduction

H SAF P-IN-MWS/MWI (H70/H71) Precipitation Product by EPS-SG MWS/MWI

- Within the EUMETSAT H SAF we develop Level 2 products providing **instantaneous precipitation rate**, on a **global scale**, from the EPS-SG MWS – MWI brightness temperatures:
 - Designed as the **Day 1 operational precipitation product** for the Metop-SG series (A&B), include **different modules** specifically designed for the detection and estimate of **rainfall and snowfall**.
 - Use of **ATMS cross-track radiometer** and the **GMI conical scanning radiometer**, similar in terms of channel frequencies and spatial resolution to MWS and MWI, respectively.
 - Different modules are based on **machine learning approach** trained using **GPM-CO** and **CloudSat** spaceborne radar precipitation products as reference



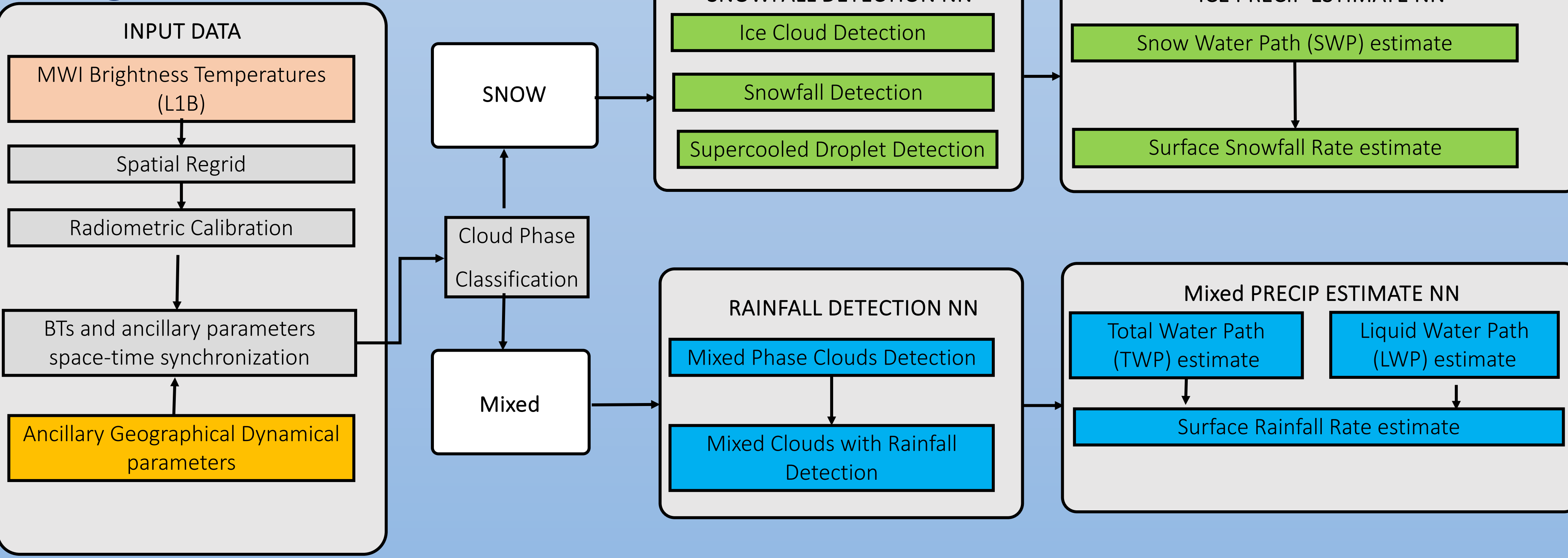
5. Snowfall event Canada 2014/11/24



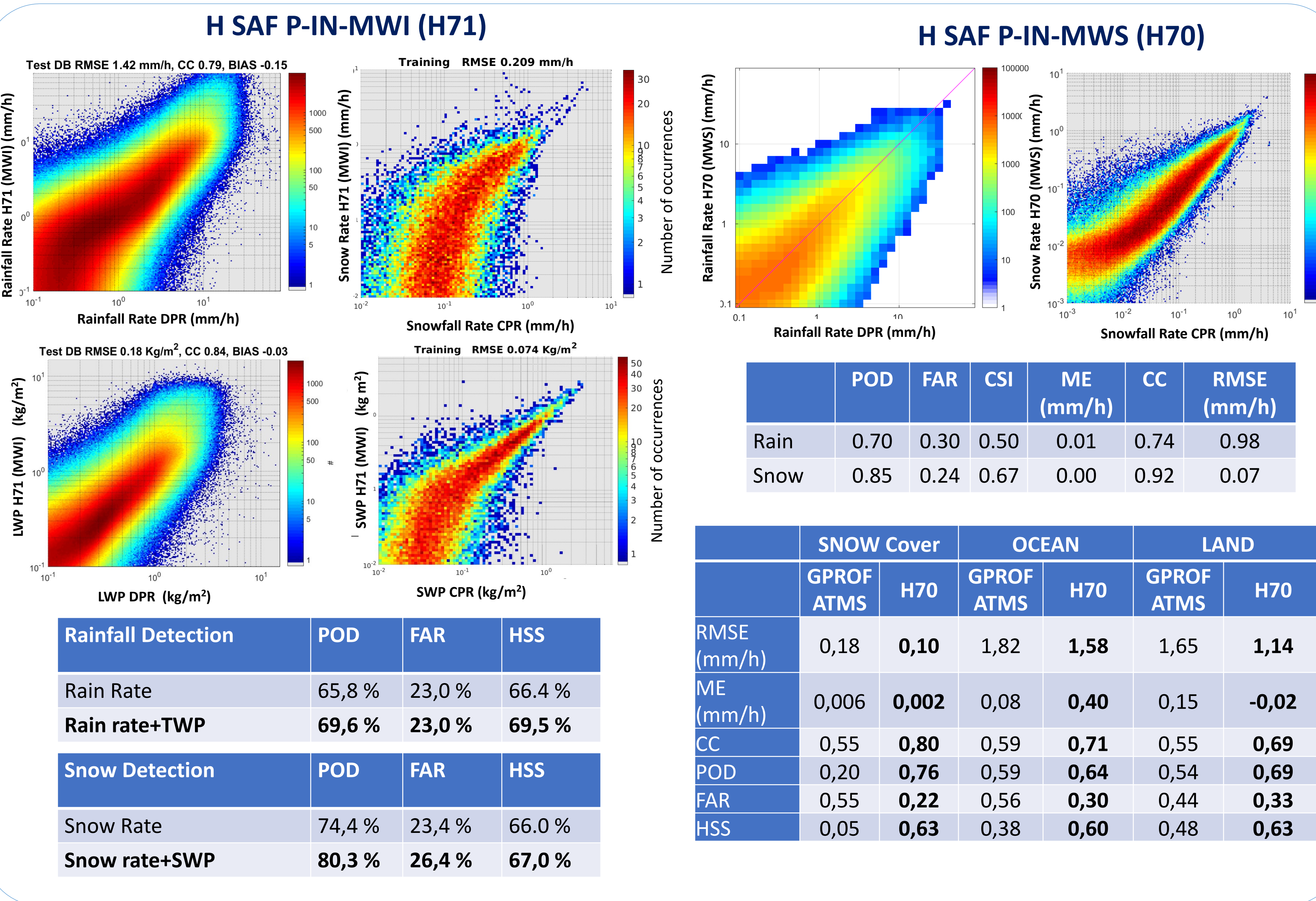
2. Training Dataset

Advanced Technology Microwave Sounder (ATMS)		EPS-SG Micro-Wave Sounder (MWS)		GPM Microwave Imager (GMI)			EPS-SG Micro-Wave Imager (MWI)			CPR-GMI	DPR-GMI	CPR-ATMS	DPR-ATMS			
Central freq. (GHz)	Pol.	Central freq. (GHz)	Pol.	Central freq. (GHz)	Pol.	IFOV (km)	Central freq. (GHz)	Pol.	IFOV (km)	Period	Geographical area	dataset size	Training/Test	Reference Rainfall product	Time window	Spatial Resolution
23.8	QV	23.8	QH	10.65	V,H	19x32	18.7	V, H	50	2014-2016	Global	250 k	90%/10%	2C-SNOW-PROFILE	Within 15 minutes	CPR and DPR averaged to 10x10 km pixel
31.4	QV	31.4	QH	18.7	V, H	11x18	23.8	V, H	50	2015	Global (up to 65° lat)	300 M	50%/50%	2B-CMB V07A Ku (NS)	Almost simultaneous	GMI brightness temperatures averaged to match the corresponding MWI channel resolution
50.3	QH	50.3	QH/QV	23.8	V, H	9.2x15	36.5	V, H	30	2014-2016	Global	2.2 M	30%/60%	2C-SNOW-PROFILE	Within 15 minutes	CPR and DPR averaged to match ATMS (90 GHz) resolution
51.7	QH			36.5	V, H	8.6x14	50-60. Band	V, H	30	2014-2016	Global (up to 65° lat)	15 M	30%/60%	2B-CMB V07A Ku (NS)	Within 15 minutes	15.8 x 15.8 (nadir) 30 x 68.4 (scan edge)
52.8	QH	52.800	QH/QV	89.0	V, H	8.6x14	118.75 Band	V	10							
53.6	QH	53.6	QH/QV	166.5	V, H	4.4x7.2	165.5±0.725	V	10							
		53.948±0.081	QH/QV	183.31 ± 7	V	4.4x7.2	183.31±6.1	V	10							
54.4-57.3 (9 ch)	QH	54.4-57.3 (9 ch)	QH/QV	183.31 ± 3	V	4.4x7.2	183.31±4.9	V	10							
89.5	QV	89	QV				183.31±3.4	V	10							
165.5	QH	165	QH				183.31±2.0	V	10							
183.3 (5 ch)	QH	183.3 (5 ch)	QV													
		229.0	QV													

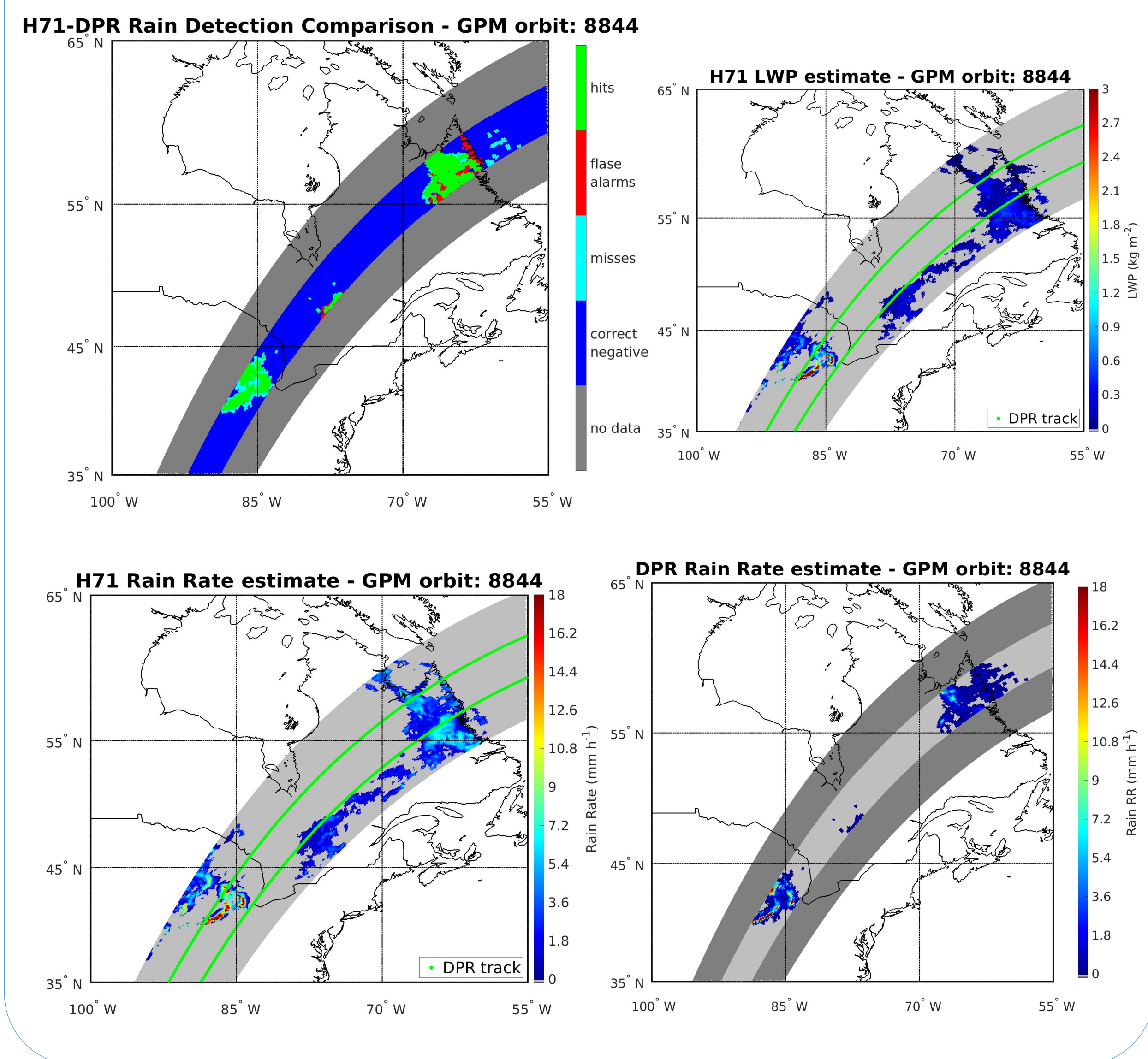
3. Algorithm Flowchart



4. Results



6. Rainfall event Canada 2015/09/19



7. Future developments

- Future activities for the MWI day-1 algorithm**
- During the commissioning phase a calibration-tuning procedure between MWI/MWS and GMI/ATMS channels will be carried out.
 - Preprocessing for co-location of MWI channels.
 - An extensive validation will be carried out a global scale to confirm the algorithms performance.

8. References

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