# Assessment of the IMERG product and its components versus surface air temperature and condition over the CONUS

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**INTRO**

- The most state-of-the-art satellite-based precipitation products provide users with merging and interpolating data gathered from different infrared (IR) and passive microwave (PMW) sensors. GPM mission is one of them with its Level 3 product named IMERG. IMERG uses IR data whenever ice or snow is presented on the surface regardless of the temperature. Our results show this is NOT the best way to leave behind PMWs (Sad PMW ☹)

**METHODS**

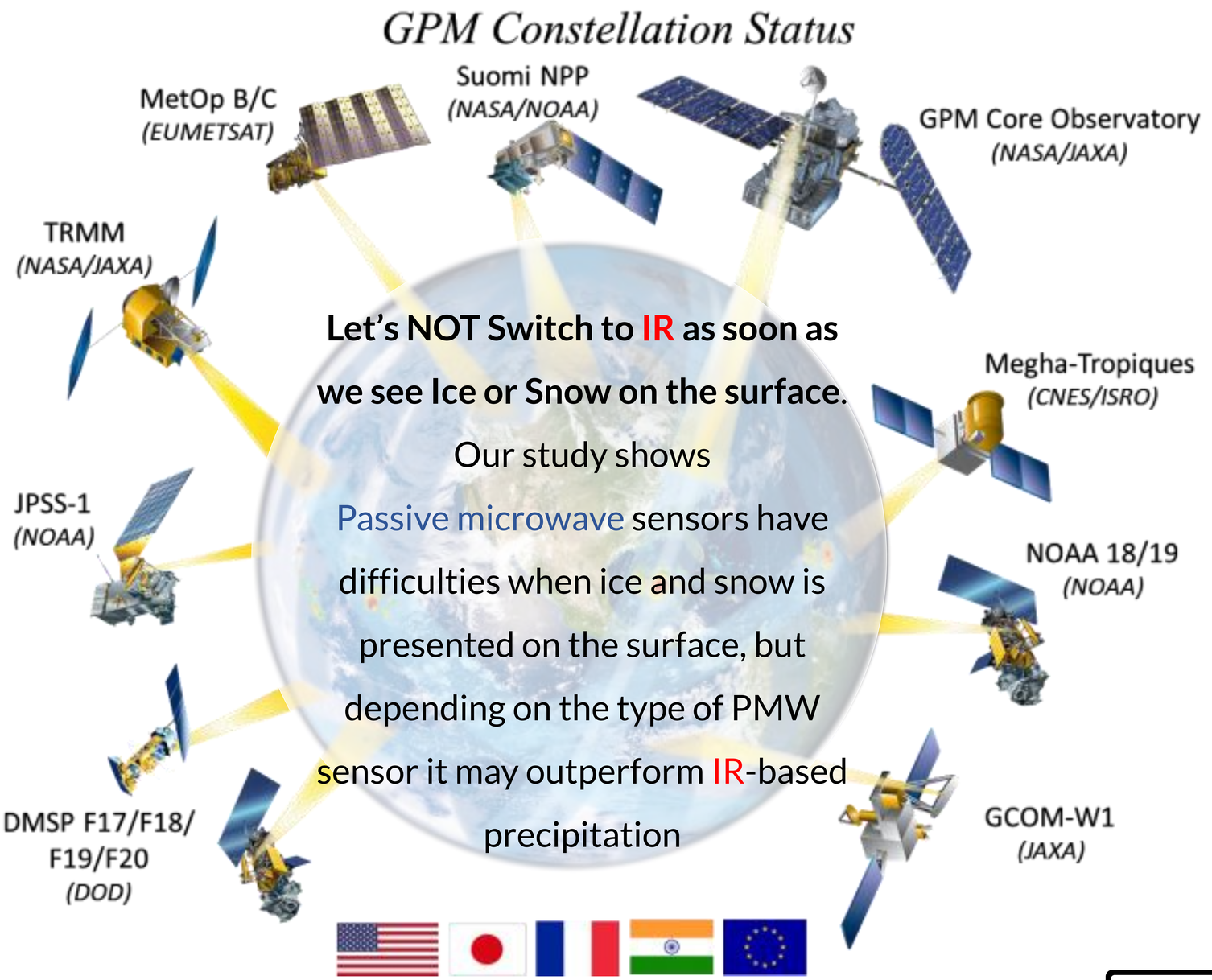
1. We compared IMERG data with NCEP Stage IV as our reference multi-radar/gauge measurements
2. Categorized measurements over frozen and ice-and-snow free surfaces
3. Eliminated orographic effects to see pure performance of PMW and IR
4. Analyzed different PMW sensors and as whole to see which one has higher statistical score

**RESULTS**

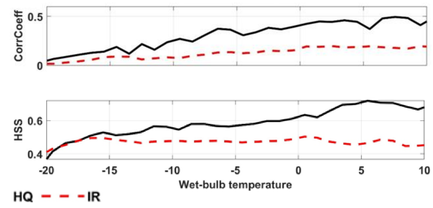
- Even in light precipitation over frozen surfaces PMW data indicate higher performance in detection and measurements considering Heidke skill score (HSS)
- Both PMW and IR data show significant improvement in measurements in higher precipitation intensities regardless of temperature and surface cover

**DISCUSSION**

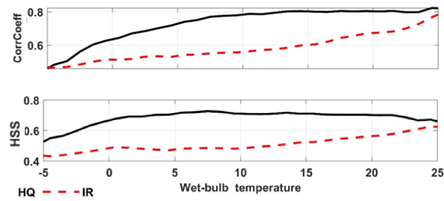
- Our findings agree with other studies concerning considerable drop in PMWs' performance over cold and frozen surfaces however IR-based measurements still underperform most PMW precipitation estimates in such conditions




Ice-and-snow covered




Ice-and-snow free




## How IMERG sees an event

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