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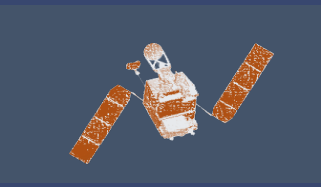
Comparison of Precipitation Measurement Radar onboard FY-3G Satellite with the Ground-based Radar over China

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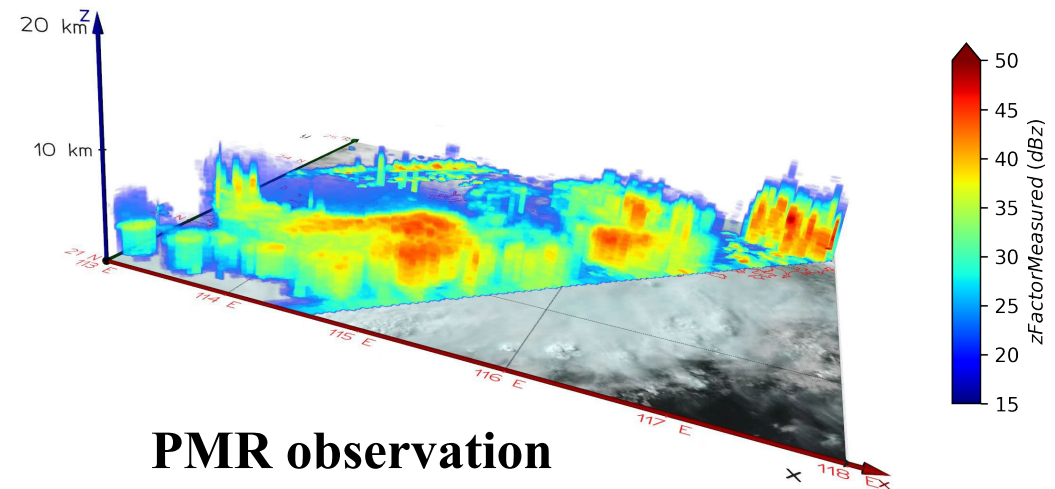
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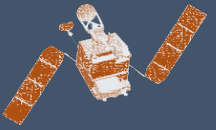




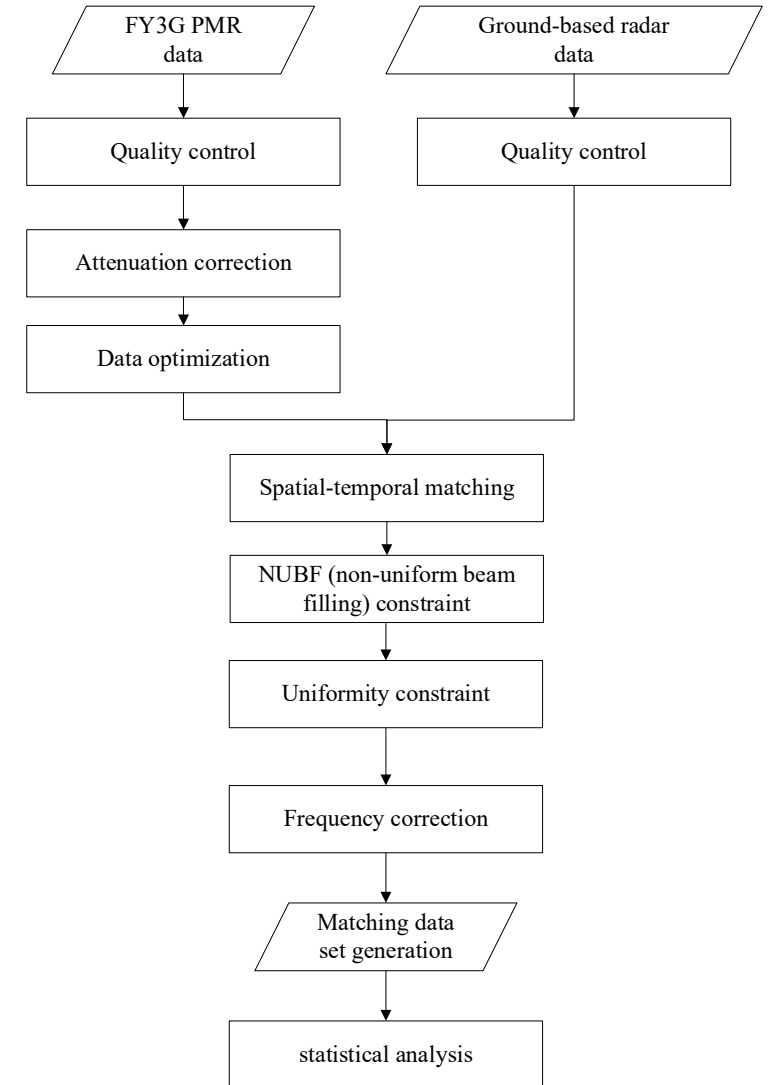
- China launched its first precipitation measurement satellite in 2023——FY-3G.
- Core instrument: **PMR——3D detection ability of precipitation systems.**
- Meanwhile, China operates 252 Doppler weather radars over Chinese mainland. The spaceborne radar can be used to realize the intensity calibration of the national networked weather radars and trace them back to the reference radar.
- Focus on comparing FY-3G PMR with ground-based weather radars (GRs).

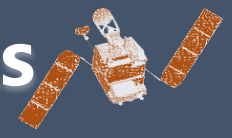
FY-3G



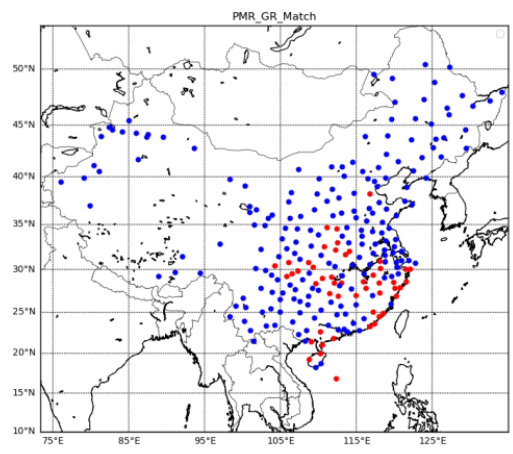


- The comparison algorithm is developed with the **detailed quality control, attenuation correction, data optimization, spatial-temporal matching, non-uniform beam filling constraint, uniformity constraint, and frequency correction.**
- The data consistency between PMR and GRs is analyzed using this method to evaluate the ability of PMR to be used in the verification and correction of data consistency among multiple GRs.

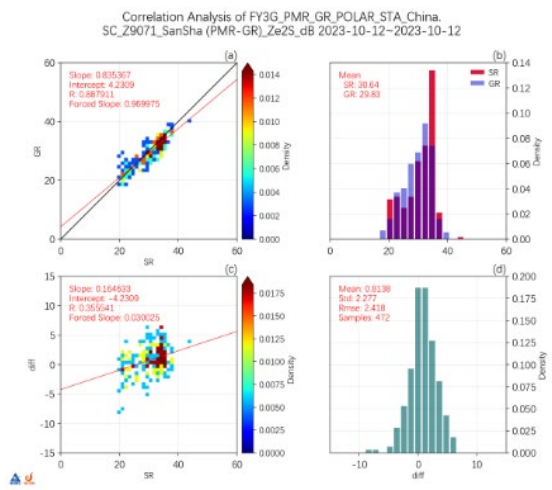




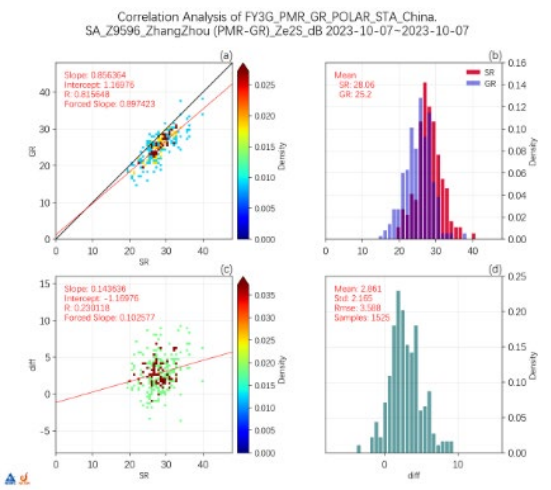
- **Data: October, 2023.** 132 operational ground-based weather radar stations working at S band are involved in the comparison, and 49 stations have matching data with the PMR. number of matching points: 10587.
- **The radar reflectivity of the PMR is quite comparable to the GRs, which demonstrates the spaceborne radar data quality is satisfying and has good ability to be used in the verification and correction of data consistency among multiple GRs.** This work also paves the way for the data fusion and joint application of satellite-ground radars in the future.



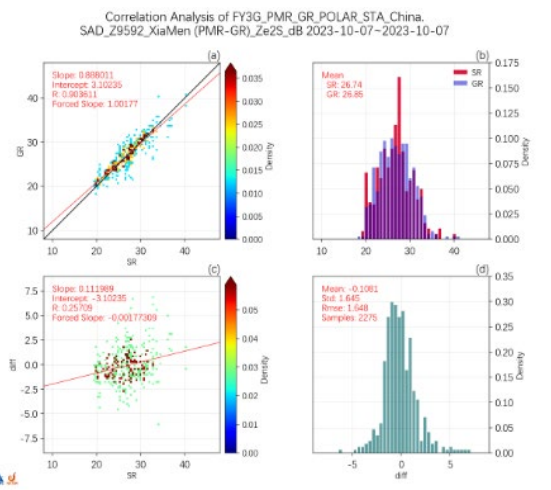
Distribution of matched stations



Sansha station



Zhangzhou station



Xiamen station