

Evaluation of vertical structure of cloud fraction simulated by IPCC AR4 global models over TWP

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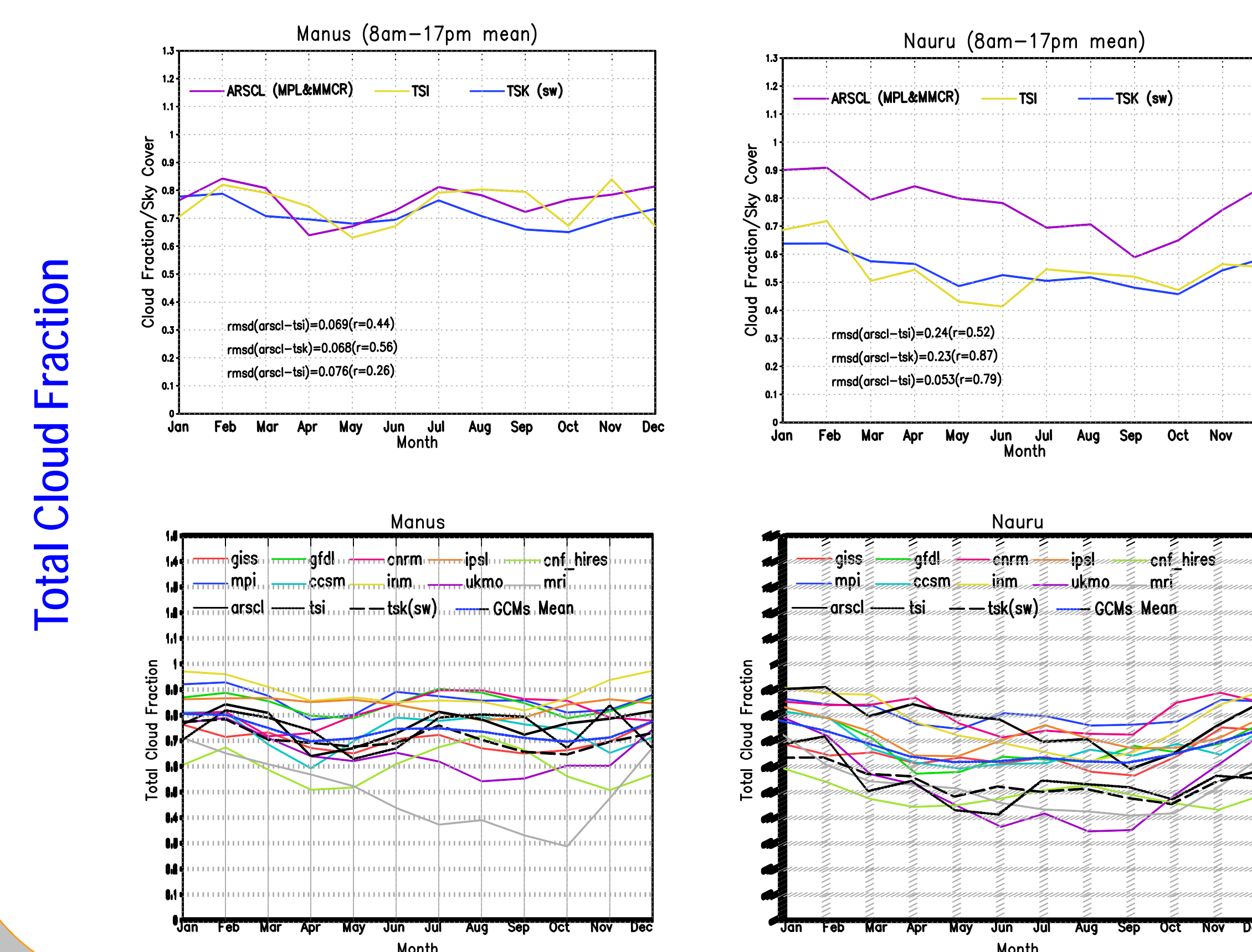


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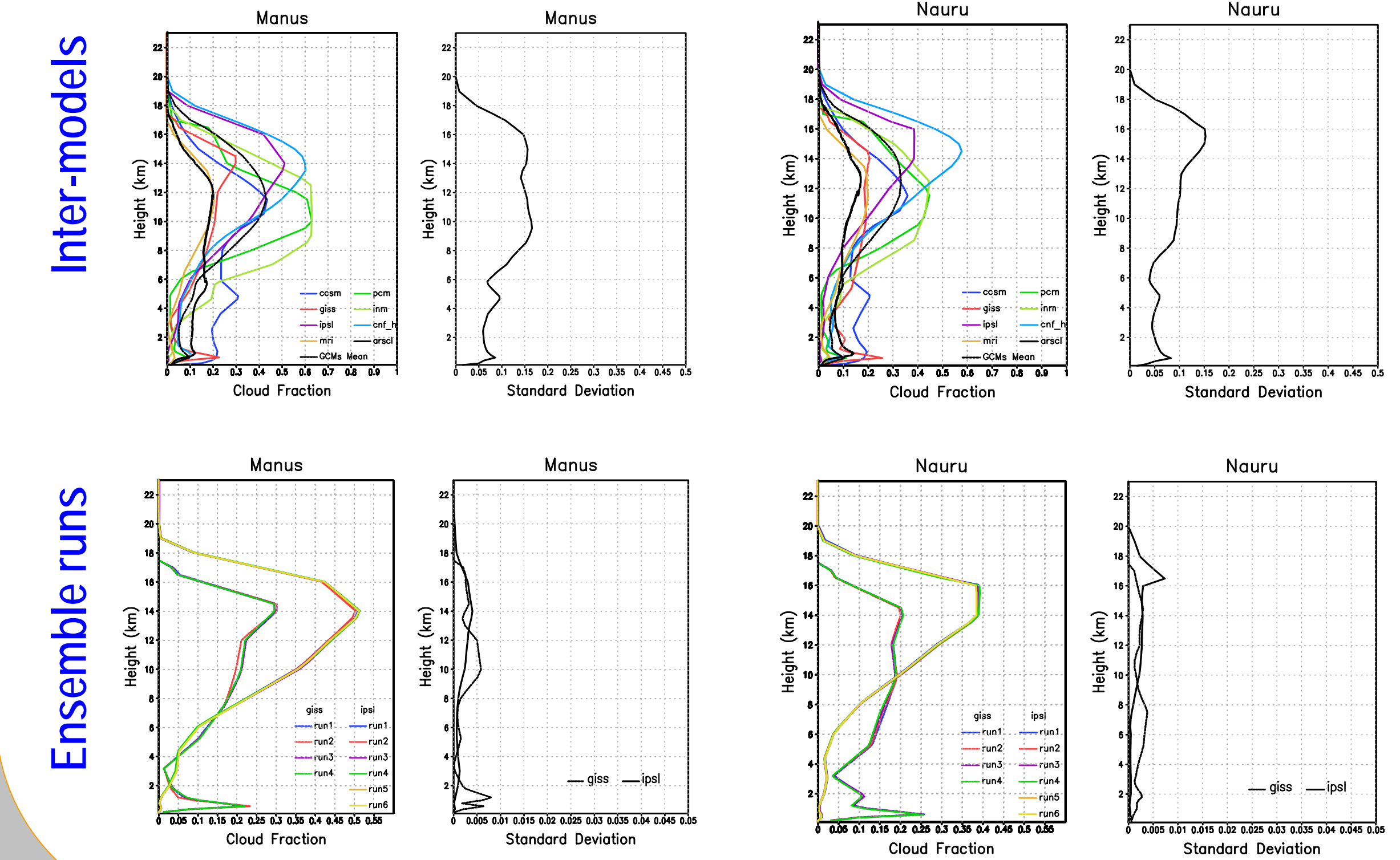
1. Objectives

- Inter-compare several cloud fraction or sky cover related datasets over ARM TWP sites to improve our understanding on cloud fraction in measurements and in global climate models
- Use ARM data to assess the vertical structure and total amount of cloud fraction in global climate models, towards the goal of improving cloud cover parameterizations in climate models over tropical regions

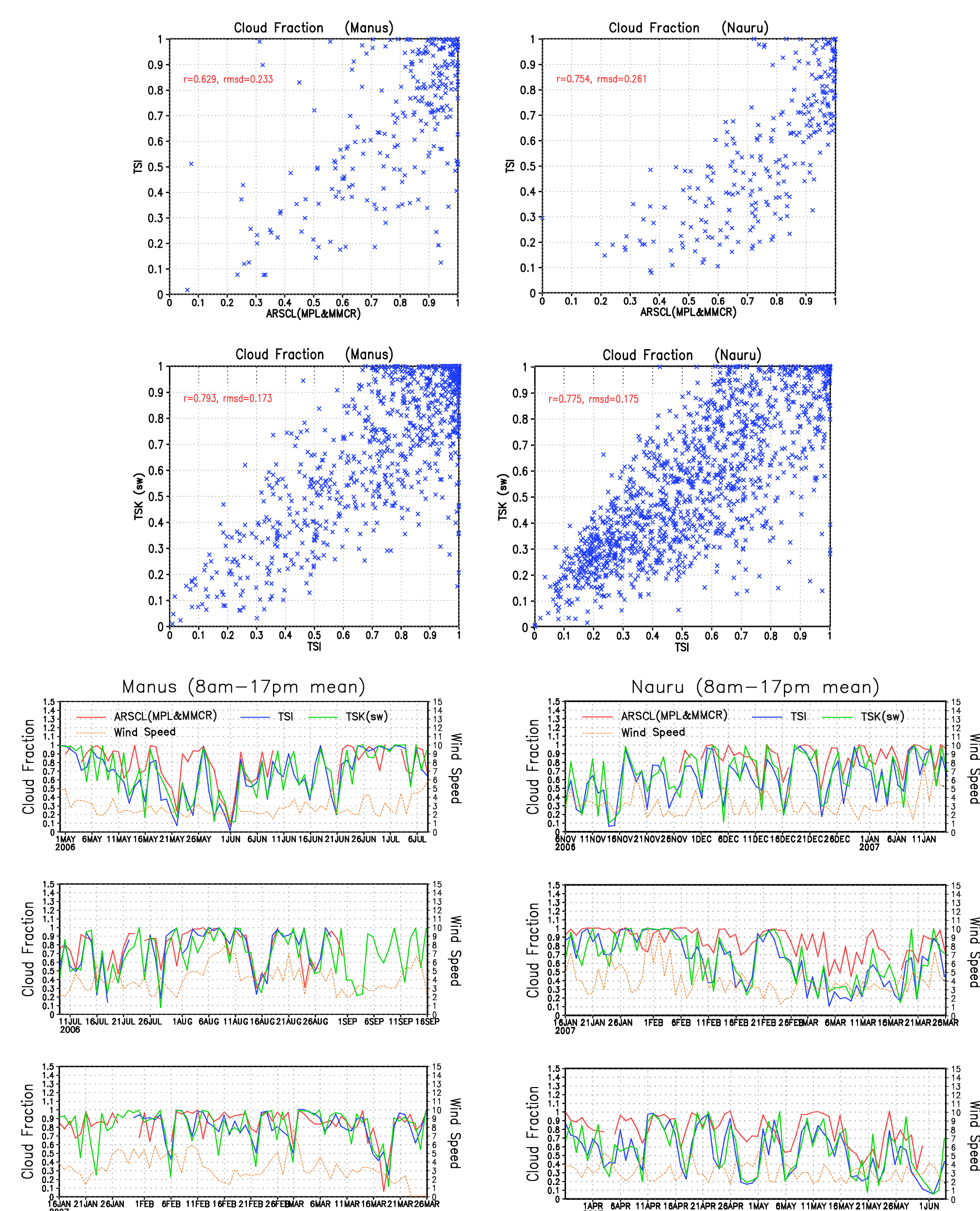
3. GCMs vs. ARM: Total Cloud Fraction



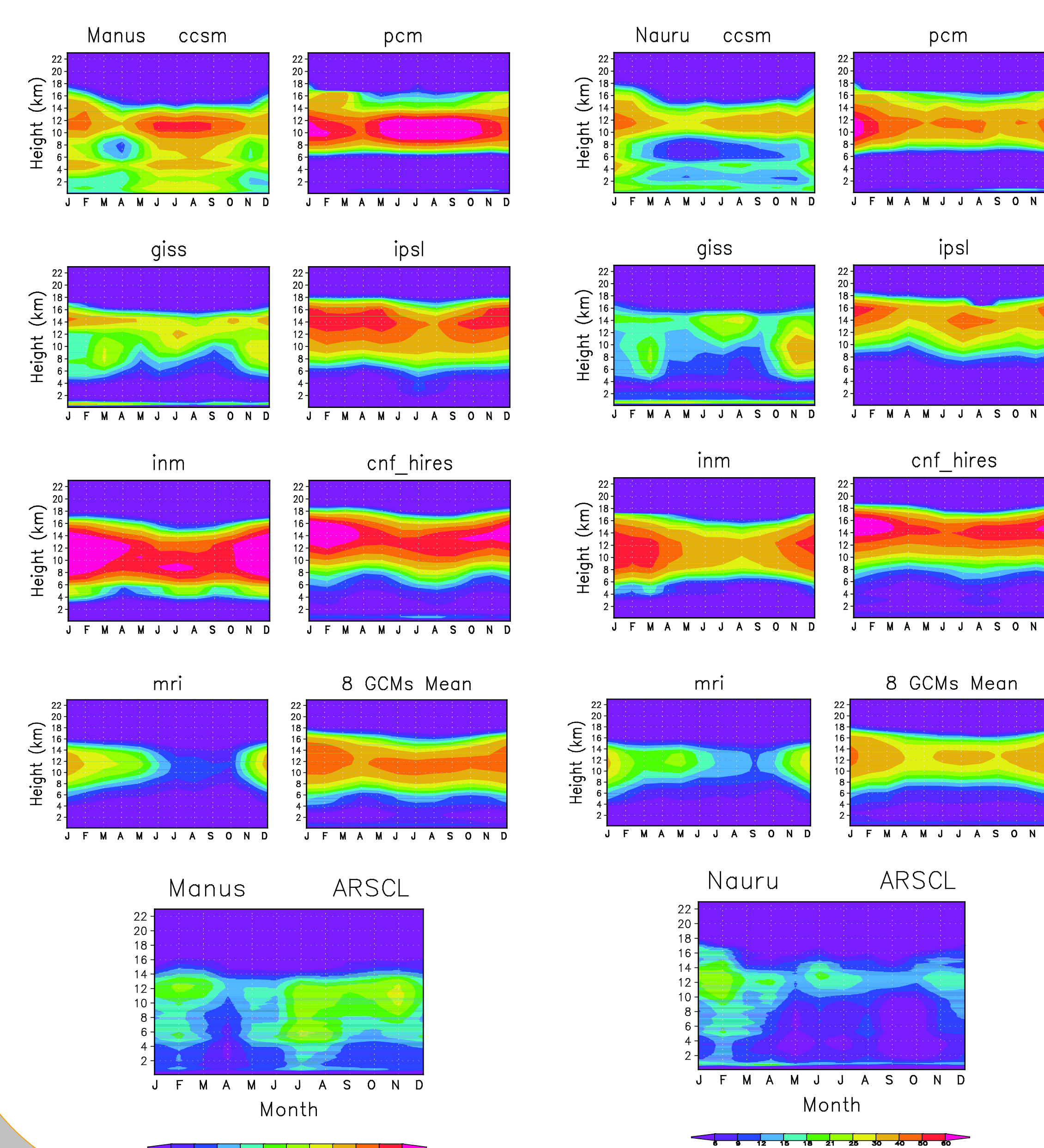
5. Vertical Profiles: Inter-GCMs and Ensemble Runs



2. Comparisons of Cloud Fraction Datasets



4. Vertical Structure vs. Seasonal Cycle



6. Conclusions

- Three Cloud Fraction (CF) related datasets, ARSCL, Total Sky Imager (TSI) and SW Total Sky Cover (TSK), are correlated at daily basis but the differences in magnitude are significant with each other.
- Multiple-year mean monthly CF are very close for ARSCL, TSI and TSK over Manus, but the ARSCL CF is larger than TSI and TSK over Nauru because of different cloud and climate regime between two sites.
- While the simulated total CF are very diverse among IPCC AR4 GCMs, the mean total CF averaged for all GCMs are close to the measurement in both magnitude and seasonal cycle.
- GCMs tend to underpredicts



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