



## **Experiment of Rain Retrieval over Land Using Surface Emissivity Map Derived from TRMM TMI and JRA25**

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We are developing a data-set of global land surface emissivity calculated from TRMM TMI brightness temperature (TB) and atmospheric profile data of Japanese 25-year Reanalysis Project (JRA-25) for the region identified as no-rain by TRMM PR, assuming zero cloud liquid water beyond 0-C level. For the evaluation, some characteristics of global monthly emissivity maps, for example, dependency of emissivity on each TMI frequency or each local time or seasonal/annual variation are checked. Moreover, these data are classified based on JRA25 land type or soilwetness and compared. Histogram of polarization difference of emissivity is similar to that of TB and mostly reflects the variability of land type or soil wetness, while histogram of vertical emissivity show a small difference. Next, by interpolating this instantaneous dataset with Gaussian function weighting, we derive an emissivity over neighboring rainy region and assess the interpolated emissivity by running radiative transfer model using PR rain profile and comparing with observed TB. Preliminary rain retrieval from the emissivities for some frequencies and TBs is evaluated based on PR rain profile and TMI rain rate. Moreover, another method is tested to estimate surface temperature from two emissivities, based on their statistical relation for each land type. We will show the results for vertical and horizontal emissivities of each frequency.