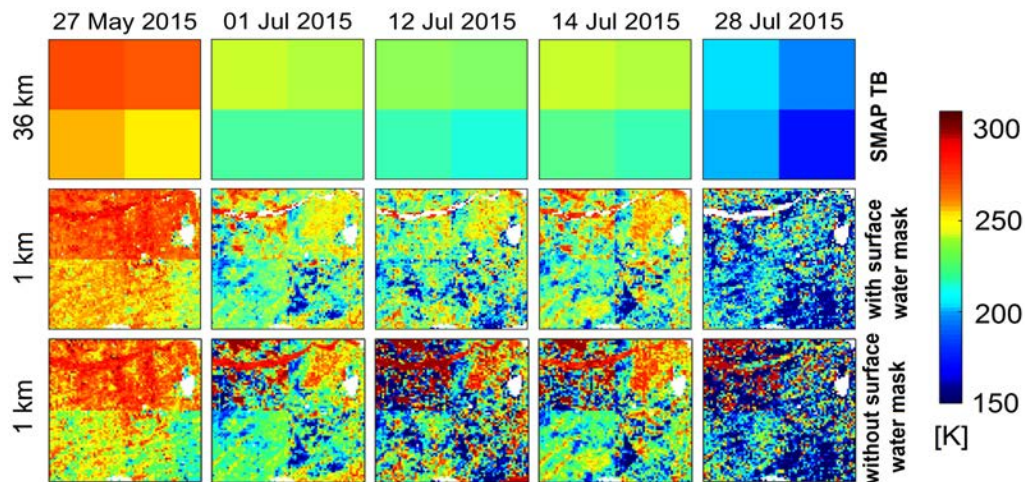


# Soil Moisture Retrieval Using SMAP L-Band Radiometer and RISAT-1 C-Band SAR Data



**Problem:** To investigate the capability of merging ISRO's RISAT-1 C-band SAR observations with the NASA's SMAP coarse-resolution L-band radiometer observations (TB) to obtain high-resolution soil moisture retrievals over seasonal flooding and ponded paddy field conditions.



SMAP radiometer-based coarse resolution brightness temperature (TB) along and high-resolution (1 km) TB with and without surface water mask that uses RISAT-1 data.

## Finding:

1. Soil moisture retrievals at high resolution (1km and 3 km) show higher ubRMSE ( $>0.06 \text{ m}^3/\text{m}^3$ ) during very wet conditions, and at low and moderate soil wetness the ubRMSE is  $< 0.06 \text{ m}^3/\text{m}^3$ .
2. Ignoring the presence of dynamic surface water bodies in active-passive algorithm would lead to abnormal disaggregation of TB at high-resolution and that affects soil moisture retrievals

**Impact:** Findings of this study will help in the implementation of a microwave active-passive algorithm to retrieve high-resolution soil moisture in challenging geophysical conditions (i.e., dynamic surface water bodies) for satellite missions involving radiometer and SAR instruments.