

# Science of 10-km L-band Radiometry

JPL

October 10-12, 2023

TOPICAL AGENDA

## Day 1

### Introduction and Motivation

- Organized by Andreas Colliander (JPL)
- **Topics:** Current state and outlook of L-band radiometry, ESA user consultation study on the need of L-band radiometry, conceptual approach for 10-km L-band radiometry
- Speakers include Andreas Colliander (JPL), Dara Entekhabi (MIT), Matthias Drusch (ESA)

### Cryosphere

- Organized by Ted Maksym (WHOI), Joel Harper (U. Montana), and Alexandre Roy (U. Quebec)
- **Sea Ice Thickness (SIT):** On sea ice and importance in the climate system, on processes observable with 10 km L-band, sea ice thickness retrieval with L-band radiometry
- **Ice Sheet Liquid Water Content (LWC):** Overview of the science problem, value of liquid water retrieval and importance of 10-km spatial scale, ice sheet LWC retrieval with L-band and multi-frequency passive radiometry, firn aquifer detection and monitoring with L-band radiometry
- **Land Surface Freeze/Thaw (F/T) and Temperature:** Importance of vegetation growth processes and methane release to Earth system, linkage of F/T and spatial scales of the processes, soil F/T retrieval with L-band radiometry, F/T retrieval enhancements with C- to Ka-band radiometry
- Speakers include Ted Maksym (WHOI), Lars Kaleschke (AWI), Joel Harper (U. Montana), Andreas Colliander (JPL), Julie Miller (CIRES), Alexandre Roy (U. Quebec), Xiaolan Xu (JPL), John Kimball (U. Montana)

### Convective Initiation

- Organized by Steven Quiring (Ohio State)
- **Convective Initiation:** Significance of convective processes in INCUS, soil moisture-precipitation interactions in the central United States, investigating spatial relationships between soil moisture and tornado events using SMAP
- Speakers include Kristen Rasmussen (U. Colorado), Trent Ford (U. Illinois), Jana Houser (Ohio State)

## Day 2

### Oceanography

- Organized by Severine Fournier (JPL) and Tony Lee (JPL)
- **Sea Surface Salinity (SSS):** Open-ocean processes, coastal processes, polar processes, operational implications, air/sea fluxes - impact of SSS at small scales, SSS retrieval with 1.4 GHz and wide-band measurements, SSS enhancement with C- to Ka-band radiometer measurements

- Speakers include Fred Bingham (U. North Carolina Wilmington), Doug Vandemark (U. New Hampshire), Julian Schanze (Earth and Space Research), Eric Bayler (NOAA), Lisan Yu (WHOI), Gary Lagerloef (ESR), Sidharth Misra (JPL), Alex Akins (JPL)

## Hydrology

- Organized by Wade Crow (USDA), Dara Entekhabi (MIT), Thomas Holmes (NASA GSFC)
- **Water and Energy Cycle:** Soil moisture and land-atmosphere coupling with higher resolution soil moisture, soil moisture downregulation of evaporation, landscape heterogeneity and enhanced retrieval quality with higher resolution soil moisture
- **Land Surface Models (LSM):** Land data assimilation and modeling, NWP/hydrologic forecasting implications, issues in soil moisture assimilation with LSM
- **Soil Moisture Applications and Retrieval:** Applications enabled with higher resolution soil moisture, surface soil moisture and plant water uptake, SM retrieval with L-band radiometry, enhancement of L-band SM retrieval with C- to Ka-band radiometry
- Speakers include Josh Roundy (U. Kansas), Paul Dirmeyer (George Mason U.), Ardeshir Ebtehaj (U. Minnesota), Stephane Belair (ECCC), Wade Crow (USDA), Sujay Kumar (NASA GSFC), Andrew Feldman (NASA GSFC), Rajat Bindlish (NASA GSFC), Thomas Holmes (NASA GSFC)

## Breakout 1

Discussions on science and measurements priorities for each discipline.

## Day 3 (half day)

### Ecology

- Organized by John Kimball (U. Montana)
- **Vegetation Optical Depth (VOD):** Importance of biomass and plant hydrology to Earth system, VOD biomass applications, VOD applications for plant hydrology, review of measuring VOD dynamics with L- through X-band radiometry
- Speakers include Paul Siqueira (UMASS Amherst), Alexandra Konings (Stanford U.), Jean-Pierre Wigneron (INRA)

## Breakout 2

Translating science and measurements priorities of each discipline to a science traceability matrix.

## Roadmap for Workshop Report and Close Out

A summary report with draft science traceability matrices will be generated and published after the workshop with the workshop input.

***Organizing Committee:***

Andreas Colliander, JPL (Chair)

Wade Crow, USDA

Dara Entekhabi, MIT

Severine Fournier, JPL

Joel Harper, U. Montana

Thomas Holmes, NASA GSFC

John Kimball, U. Montana

Tony Lee, JPL

Ted Maksym, WHOI

Steven Quiring, Ohio State

Alexandre Roy, U. Quebec