

## Satellite inspired hydrology in an uncertain future: a H SAF and HEPEX workshop



Contribution ID: 2

Type: **Poster presentation**

### Improving the Temporal Resolution of Global-scale Soil Moisture Estimates using GPS Signals and Data Assimilation.

The interaction between land and atmosphere is governed by water in the topsoil layer since the amount of surface soil moisture determines the partitioning of outgoing energy flux into latent and sensible heat fluxes. However, despite its immense importance, our understanding of the physics of diurnal water and energy cycles on a global scale is limited. In particular, the coverage of current satellite-based soil moisture observation systems is not spatially and temporally continuous, and thus causes data gaps in the current data assimilation systems; this limitation hampers researchers' understanding of fundamental processes controlling the surface hydrologic cycle and land-atmosphere interaction across both time and space domains.

In this study, we suggest a new soil moisture data source and use an assimilation system to provide accurate diurnal surface soil moisture information by utilizing recently launched microsattellites, the Cyclone Global Navigation Satellite System (CYGNSS), and the Land Information System (LIS) that was developed at NASA. With its advantage of frequent temporal repetitions, the CYGNSS will be able to derive soil moisture data with a strong potential to improve modeling capabilities by filling the gap in sun-synchronous orbit satellite observations, thus creating continuous soil moisture observations.

#### Which session would you like to present in?

1. Remote sensing, hydrological modelling and data assimilation

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