

## **CYGNSS: Global Remote Sensing With a Constellation of Small Satellites**

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This presentation will start with an overview of the NASA Cyclone Global Navigation Satellite System (CYGNSS) mission and update of its current status at 2 years after launch. CYGNSS consists of a constellation of eight satellites in a single orbit plane, launched using a single launch vehicle. Each CYGNSS satellite carries a GNSS Reflection (GNSS-R) instrument, which is capable of tracking up to four parallel surface reflections from the Global Positioning System (GPS) constellation. The CYGNSS instrument maps the reflected power in time/delay and Doppler space to form Delay Doppler Maps (DDMs) which can be used to estimate near surface wind and surface short waves over ocean and soil moisture and flood inundation over land.

The initial mission goal of CYGNSS was to study ocean wind and waves, with an emphasis on tropical cyclone studies. A small constellation was an optimal way to provide the revisit time necessary to observe the rapidly changing wind dynamics, including through the heavy precipitation, encountered in developing hurricanes.

This presentation will include an analysis of the CYGNSS temporal and spatial coverage achievable with a constellation of eight small satellites. Additionally, how the individual observatories in the constellation have been maneuvered to achieve optimal spatial and temporal sampling using a differential drag technique will be described. The successes and difficulties of the differential drag orbit maintenance technique will be discussed.

Finally, operational plans and performance modifications for the CYGNSS constellation entering its extended mission phase will be discussed, including potential improvements in the on-board processing to enhance land observables in addition to its existing ocean science data products.