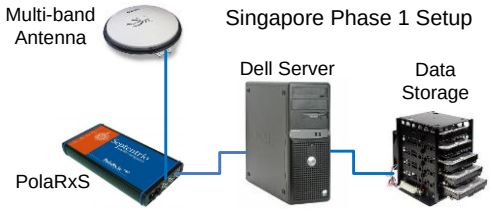
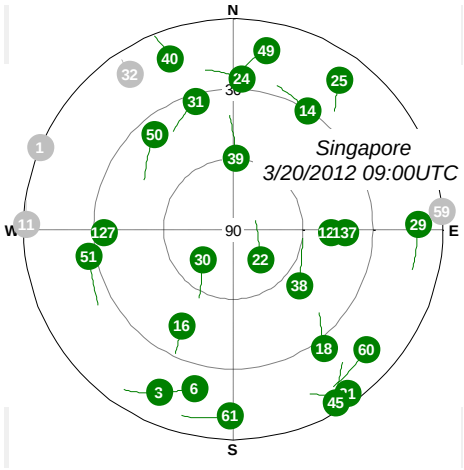
Singapore Ionosphere Scintillation Studies

PI: Yu (Jade) Morton, Miami University; Frank van Graas, Ohio University

Sponsor: AFOSR, AFRL-RYMN





This project will extend our current successful high-latitude effort to the equatorial scintillation zone. Singapore's geographical location makes it an ideal place to collect data for equatorial ionosphere scintillation studies. In addition to being situated in an area where there are frequent natural equatorial scintillations, Singapore is also ideally located to have direct view of a large number of satellites from nearly every GNSS constellation including GPS, GLONASS, Compass, and Galileo. The large number of satellites and signals are critical in ionosphere tomography studies and scintillation spatial distributions. We propose to install a multi-constellation, multi-band global navigation satellite systems (GNSS) receiver and data collection system in Singapore for our initial effort. This project consists of two phases. The phase 1 setup involves a single commercial multi-constellation ionosphere monitoring receiver, a multi-band GNSS antenna, a data storage system, and a server control unit. Custom remote monitoring and control software and automatic event triggering software compute the scintillation level in real time, based on the receiver inputs, and triggers the storage system to store the data when a pre-set threshold level is reached. The phase 2 effort includes the addition of an array of wide bandwidth RF data collection systems for adaptive post processing and tomography studies.