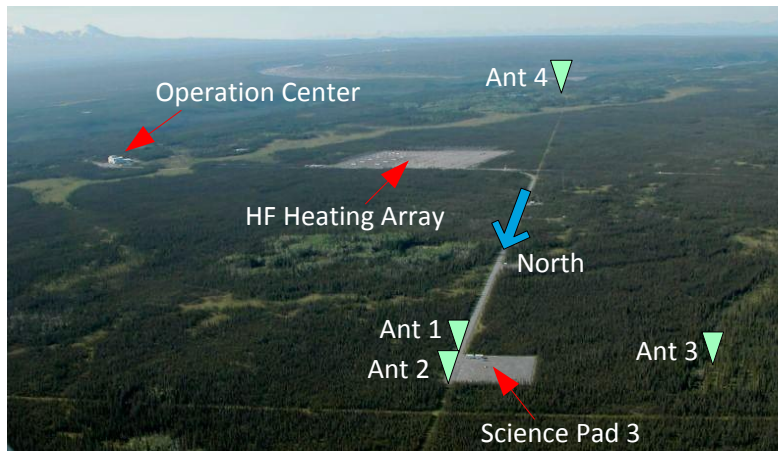


Developing satellite signal parameter estimation algorithms for high-accuracy applications

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As we enter a new solar maximum period, GNSS receivers, especially the ones operating in high latitude and equatorial regions, are facing an increasing threat from ionosphere scintillations. The increased solar activities, however, also offer a great opportunity to collect scintillation data to gain better understandings of scintillation effects on GNSS signals. To effectively conduct these studies, high quality, unprocessed GNSS receiver front end raw IF samples collected during ionosphere scintillations are necessary to produce realistic scintillation signal parameter estimations. This project allowed us to establish a unique GNSS receiver array at HAARP, Alaska to collect GPS and GLONASS satellite signals at various stages of the GNSS receiver processing. A large amount of data containing signal strength, carrier phase, and relative TEC measurements generated by the receiver array as well as additional on-site diagnostic instrumentation measurements during both natural and artificially controlled scintillation events are being accumulated at this site. These interesting results demonstrate the feasibility and effectiveness of our experimental data collection system in providing insightful details of ionosphere responses to active perturbations and natural disturbances.

Further Readings:

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