

Antenna Array Beamforming & Space-Time Processing Algorithms for Wideband Telemetry Digital Communications

Principal Investigator: Dr. Yimin Zhang

Summary:

We develop the exploitation of array beamforming technology in wideband integrated Network Enhanced Telemetry (iNET) aeronautical communication applications where our goal is to maintain reliable and critical communications integrity and adequate signal-to-noise ratio (SNR) levels. The iNET architecture adopts a network-based architecture for use in weapons and aircraft systems test and evaluation. Array beamforming techniques have been widely used in wireless communications, underwater acoustics, and radar systems for a variety of reasons. By flexible steering of beams and nulls, an array can enhance desired signals whereas the undesired signals such as interference and jammers are suppressed. The proposed adaptive beamforming technology is DSP-based and network-aware, and is designed for the use at aerial vehicle (AV) platforms to increase transmission power efficiency, improve receiving signal sensitivity, mitigate interference/multipath effects, and extend the communication range.