Company and Technology Background

IMSAR LLC has technology that is able to track airborne moving targets. We are extending this technology to search and avoid (SAA) and detect and avoid (DAA) systems for unmanned aerial systems to help integrate them into the national airspace (NAS). This license will allow us to collect the information necessary to refine requirements for SAA & DAA systems for the NAS. We are doing this in conjunction with industry groups, such as the RTCA.

Our system works by utilizing a swept (in frequency) CW transmit waveform and mixing the returned results with the TX signal to produce a baseband signal where distance is proportional to the baseband frequency. This signal is further processed to detect the range of targets and their direction from the radar using monopulse beam processing.

Specific goals we plan on achieving are verification of real world radar performance compared to simulation (probability of detection at range, revisit rates, power draws, RF self-interference and environmental interference, needed transmit power, coexistence of multiple radars, etc.). This will be accomplished in testing on the ground and in the air. This will also allow the refinement of the hardware.

IMSAR performs SAR tests from a small aircraft typically flying between 2,000 and 6,000 feet in altitude (above ground level). Transmission is a linear frequency modulated (LFM) signal with the frequency being swept from the minimum to the maximum frequency around 1000 times per second. Because the transmission power is relatively low and the frequency sweeps very rapid, the average power at a given frequency is extremely low (low duty cycle).