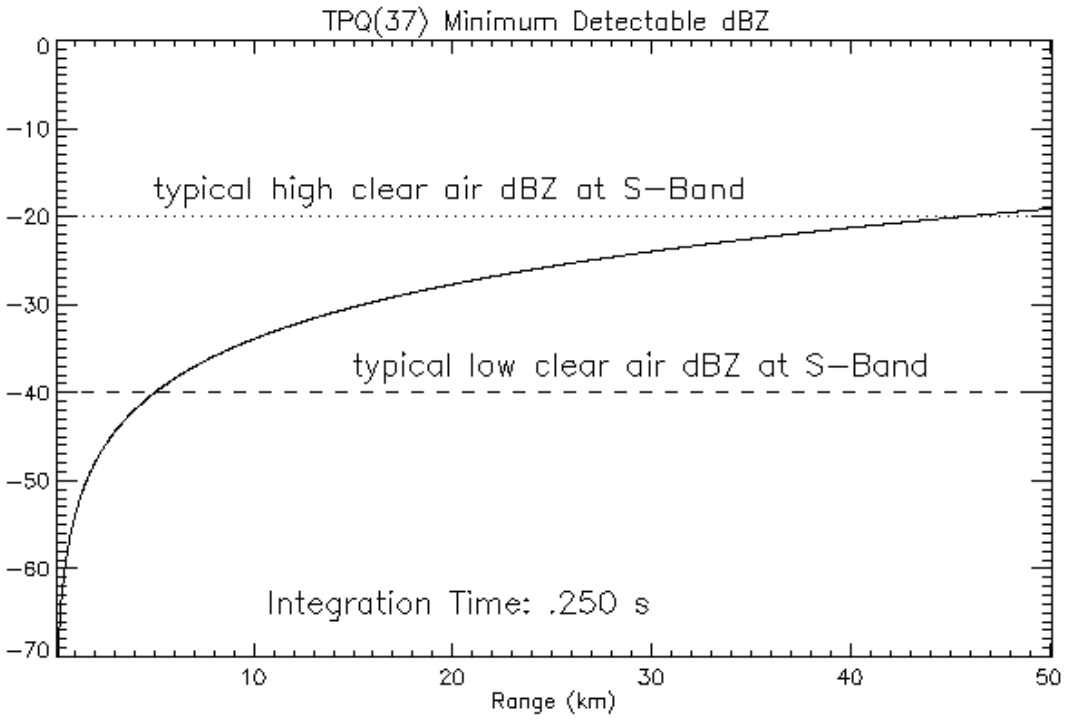
We estimate the TPQ-37 performance for a metrological application and have calculated its dBZ sensitivity shown in the chart below:



For this curve the radar's configuration is as follows:
Peak power: 120 KWatts
PRF: 3 kHz
Range Resolution: 150 m
Dwell time (integration time): 250 ms
Scan time: 4 beams per second

The dBZ sensitivity graph predicts that TPQ(37) could observe/measure clear air turbulence up to (at least) 60 km with a scanning rate of 4 beams (looks) per second.

It seems to us that surveillance and imaging of clear air turbulence could be a niche capability of the modified TPQ-37. This system has more than sufficient sensitivity to observe return from clear air up to 60 km range from its location and also the phased array technology of

the TPQ-37 allows for high temporal resolution of the collected data. This system could provide outstanding measurements of the surf zone boundary layer or look at a region of the boundary layer from the fantail of a ship. We should also be able to easily observe Sea Spray.

Also, TPQ-37 operates at similar frequency as NEXRAD systems which allows for a fusion of data simultaneously collected by TPQ-37 and NEXRAD. This combined data set would allow for multiple "looks" from different and independent azimuth angles at the same weather features. So, the TPQ-37 could be set up say 20 - 30 km or so from a WSR-88D and there can be dual-Doppler collection. An exciting application might be 20 - 30 km or so from a WSR-88D during landfall of a tropical cyclone.

Big drawback of this system is beam width.

I've also attached some specification info on the TPQ-37 and a paper on pulse compression, when looking at the TPQ-37 specs, the pulse widths are 1.6 usec and 140 usec, which is very large, so we needed to factor this into the compression ratio.

Thanks,

Bob