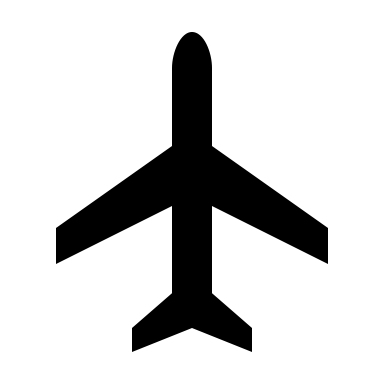
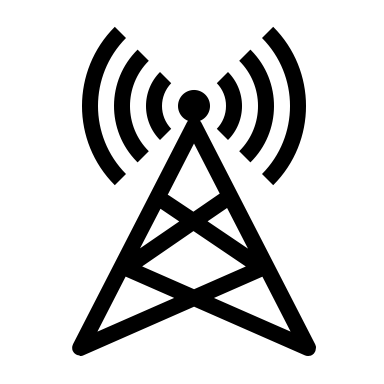
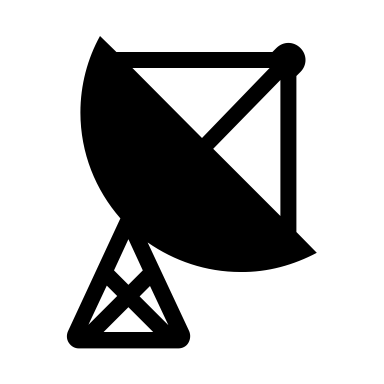
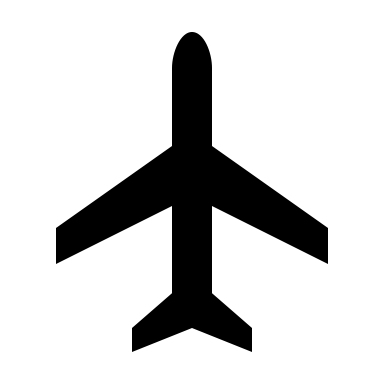
Tutorial 30th of March 2023

A TV transmitter is used as illuminator of opportunity by a Passive radar to monitor the airspace using the following geometry.

Tx



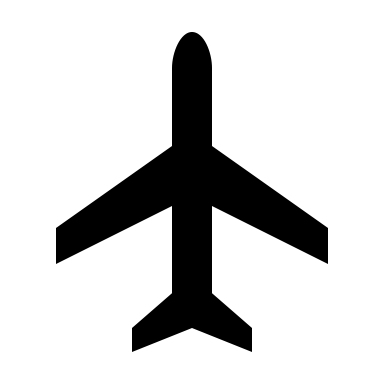
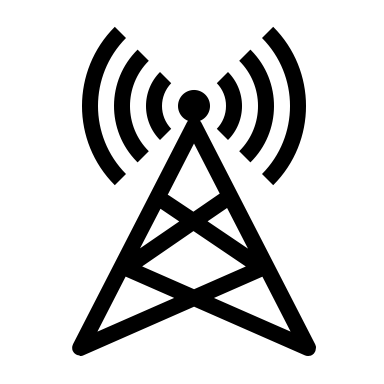
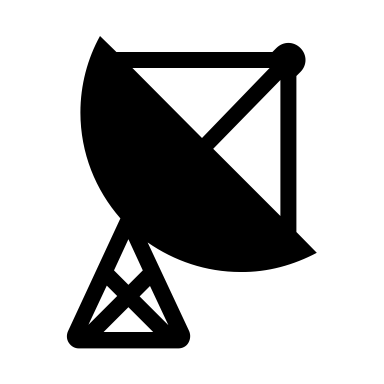
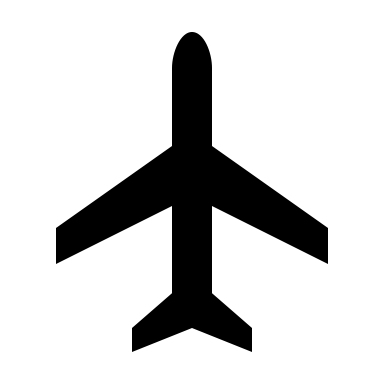
Rx

The TV transmitter works at 800MHz carrier frequency and transmits continuously a signal with 10MHz bandwidth.

What is the minimum received data matrix for 5 seconds of acquisition size if the radar is willing to be able to detect targets with a speed up to 40 m/s?

Two airplanes are approaching the surveillance area flying towards the radar system, one at 30 m/s and another one at 35m/s. How many slow time samples are needed to discriminate the two targets in velocity ?

What happens to the speed discrimination capability if the receiver is located in a different location as below ?



Tx

Rx