

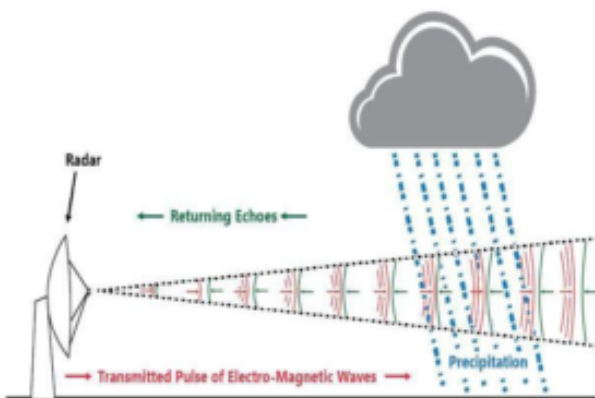
Doppler Weather Radars

February 25, 2021

In News: Union Minister for Earth Sciences commissioned two of the ten indigenously built X-Band Doppler Weather Radars (DWR)

About Doppler Weather Radars

- Developed By : The DWR has been designed and developed by ISRO and manufactured by Bharat Electronics Limited (BEL), Bengaluru.
- Weather Radars are the basic and most important tool for a Meteorologist for Nowcasting and Forecasting of various severe weather events.
- Based on Doppler principle the radar is designed to improve precision in long-range weather forecasting and surveillance using a parabolic dish antenna and a foam sandwich spherical radome.
- DWR has the equipment to measure rainfall intensity, wind shear and velocity and locate a storm centre and the direction of a tornado or gust front.



Doppler Weather Radar Products can be used for the following applications

- Weather surveillance
- Severe weather monitoring
- Hurricane, typhoon, and cyclone tracking

- Hail detection
- Hydrometeorological applications, such as flood forecasting
- Airport wind-shear detection
- Meteorological research
- Weather modification
- Agriculture
- Radiosonde Launch support systems

X and C Band Radars

- **X band radars** operate on a wavelength of 2.5-4 cm and a frequency of 8-12 GHz. Because of the smaller wavelength, the X band radar is more sensitive and can detect smaller particles. These radars are used for studies on cloud development because they can detect the tiny water particles and also used to detect light precipitation such as snow. X band radars also attenuate very easily, so they are used for only very short range weather observation. Also, due to the small size of the radar, it can therefore be portable like the Doppler on Wheels.
- **C band radars** operate on a wavelength of 4-8 cm and a frequency of 4-8 GHz. Because of the wavelength and frequency, the dish size does not need to be very large. The signal is more easily attenuated, so this type of radar is best used for short range weather observation. The frequency allows C band radars to create a narrow beam width using a smaller dish.