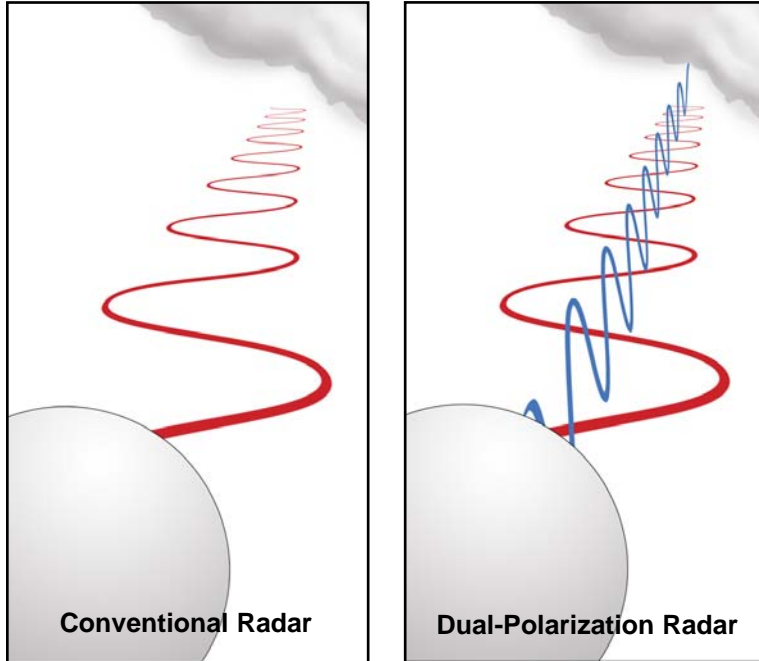


Dual-Polarimetric Radar: A Primer

Radars operate by transmitting horizontal beams of energy into the atmosphere. When the energy comes into contact with precipitation suspended in the clouds, it is reflected back to the radar. From the characteristics of the returned signal, the radar can determine the location and intensity of precipitation. The strength of the returned signal is called reflectivity.



Reflectivity has limitations, however, because it reveals little about the types of precipitation actually present in the atmosphere. Depending on conditions at the time, the meteorologist must infer whether certain types of precipitation, such as hail or snow, are in the clouds and could affect people on the ground.

Dual-polarimetric radar systems provide a solution to this problem. By transmitting a beam split into both horizontal and vertical planes, this new type of radar can reveal important details on the shape, orientation and state of precipitation, allowing more accurate detection of weather events that will affect the public.



Now, meteorologists will be able to see specifically where pockets of hail are located inside thunderstorms, leading to faster, more precise alerting of the public. In addition, the more accurate precipitation estimates afforded by dual-polarimetric radar will make it easier for them to determine the areas of a storm likely to produce flooding conditions on the ground.

Dual-polarimetric capability is also advantageous during winter weather. The distinctions between rain, wet snow and dry snow, for instance, will be much clearer. The public will receive better information on which parts of their neighborhoods are susceptible to frozen precipitation that may impede the daily routines of citizens.

A nationwide network of over 170 radar installations comprise the National Weather Service's NEXRAD program. Over the next five years, Baron Services will work in conjunction with L-3 Communications to incorporate dual-polarimetric capability into NEXRAD. The National Severe Storms Laboratory (NSSL) estimates that dual-polarimetric radar technology has the potential to save the public \$690,000,000 annually by improving precipitation estimates. In addition to improved forecasts and more accurate warnings, citizens across the country will receive better information on flooding and frozen precipitation as a result of the technology's implementation