Receiver Upgrade for the Polarimetric C-Band Radar POLDIRAD

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The Selex ES GmbH has been awarded a contract to upgrade the first European full polarimetric weather radar system POLDIRAD (Polarimetric Diversity Doppler Radar) operated by the DLR Institute of Atmospheric Physics in Oberpfaffenhofen.

Main part of the upgrade was the implementation of a customized antenna mounted C-Band receiver, based on the Selex Dynrex (dynamic range extension) design, by retaining the unique high-power polarization switch, the offset fed antenna and the magnetron based transmitter. The polarization switch was embedded in the environment of the new analog and digital receiver chain and an appropriate signal processor backend was provided to conduct the full polarimetric signal processing for different transmit and receive polarization modes.

In this publication the receiver upgrade implementation in the existing system and the resultant system design will be presented. The new internal and external calibration concept for establishing accurate polarimetric radar measurements and the receiver GPS synchronization concept will be explained.

Finally the inherent system improvements will be stated and examples will be shown. A new programming interface allows the implementation of new developed or modified radar products by the user into the real-time data processing chain.