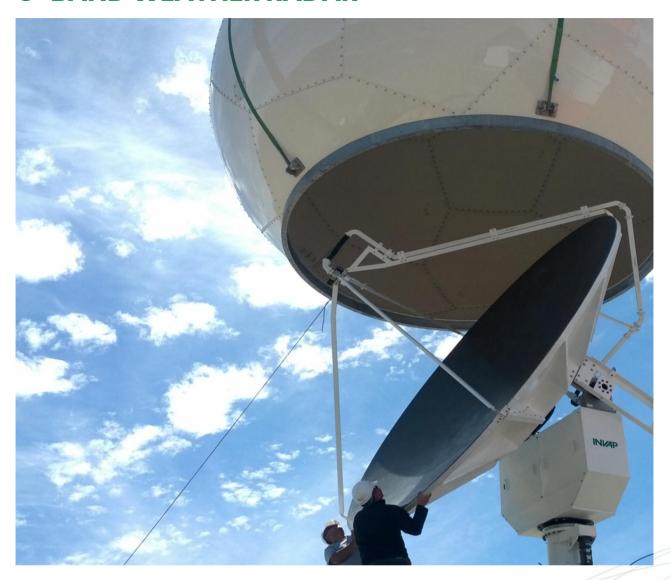


C-BAND WEATHER RADAR



INVAP C-band weather radar has Doppler and Dual-polarization capabilities.

The system continuously transmits a train of pulsed electromagnetic energy to scan the atmosphere 360 degrees around, sweeping from 2 degrees below the horizon up to 92 degrees in elevation.

Argentina's weather network composed of 12 of this radars has been developed, manufactured, installed and supported by INVAP since many years. It processes the signals received by the antenna and generates dual polarization variables to get improved rainfall estimates and separation of echoes produced by hydrometeors (drizzle, rain, snow, hail) from those produced by non-meteorological sources such as: insects, flocks of birds, buildings, mountains, etc.

By processing this data, users can locate and track the different sources of echoes.

Numerical models can also be used to make very good short-term forecasts.



Technical specifications

Operational frequency range 5450-5820MHz (C-Band)

Pulse duration (PW) $0.4 - 3 \mu S$

User adjustable at 20 ns steps

Pulse repetition frequency (PRF) 300 - 2000 Hz

User adjustable at 1 µs steps

Typical operational range/technical range

240 km / 480 km

Sensitivity -20 dBZ at 25 km (3 μ s pulses)

-10 dBZ at 25 km (1 μs pulses)

Clutter filtering capabilities Better than 40 dB, adaptive identification and

removal, dynamic clutter map, updated in real

time, scan by scan.

Doppler spectral moments TH & TV, total (uncorrected) reflectivity

DBZH, DBZV, corrected (clutter filtered) reflectivity

VRAD, radial velocity

WRAD, spectral width of the radial velocity

Polarimetric variables ZDR, differential reflectivity

PHIDP, differential phase shift KDP, specific differential phase RHOHV, correlation coefficient

Data quality variables CMAP, cell identification map (clutter)

SNR, signal to noise ratio SQI, signal quality index





Technical specifications

ANTENNA

Type Center feed parabolic

solid reflector

linear dual polarization

(H/V) feed horn

Diameter 4.48 m

Half power beam width < 0.9 °

Gain 45 dBi typical

Peak side lobe Better than -27 dB

Cross pol isolation Better than -35 dB

PEDESTAL

Position accuracy Better than 0.1°

Elevation range -2° to 92°

Rotation 360° continuous to 6

rpm

Scan modes PPI, RHI, Manual

ANALOG RECEIVER

Type Superheterodyne,

dual down conversion,

with image reject

mixing

Intermediate 905 / 70MHz

frequency (IF)

Linear dynamic range > 90 dB

Minimum Discernible -114 dBm typical

Signal (MDS)

Noise figure Better than 3 dB

DIGITAL RECEIVER

Type Modular, 4 channels,

16 bits ADC.

FPGA based signal

pre-processor

Sampling frequency 100 MHz

I/Q time series 24 bits, 5 Mega

sample/s

Host computer Commercial off-the-

shelf, rackable PC

Operating system Linux

TRANSMITTER

Type High power coaxial

Magnetron

Modulator Digital, solid state

Peak power 320 kW Duty cycle 0.1%

SIGNAL PROCESSOR

Type Scalable, multicore

parallel processing, PCIExpress **2496** cores

GPU

Doppler PPP and FFT

Velocity dealiasing Staggered PRF, 2/3, 3/4

and 4/5

Host computer Commercial off-the-

shelf rackable PC

Operating system Linux

SAFETY AND SECURITY

Automatics interlock Radome inner door

RF lock switch,

pedestal lock switch

Receiver protections TR cell and power limiter
Transmitter VSWR isolator and

protections automatic overduty

detection

RF sector blanking Per azimuth, below user

selectable elevation

User authentication Required to control the

radar

LOCAL STORAGE

Disks 6, SATA (1TByte each)

Base data 2 TB redundant, RAID 1+0

I/Q time series 2 TB Stripping 1+1









INVAP's headquarters are located in San Carlos de Bariloche at the foot of the Patagonian Andes. The company has offices in several cities throughout Argentina and operates in various countries.





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