

Selex Systems Integration GmbH
Gematronik Weather Radar Systems

Dual Polarized X-Band Radar 50DX

RainGain April 2013

presented by Maik Schürmann



METEOR 50DX

METEOR 50DX



Mobile Version



Stationary Version

METEOR 50DX



- Location: Columbia, Antonio Narino Airport
- Type: Fixed Installation
- Altitude: 1834m

Scientific Customers



METEOR 50DX	1	France	2013	ENPC ParisTech
METEOR 50DX mobile	1	Germany	2011	KIT Karlsruhe Institute of Technology
METEOR 50DX mobile	2	Iceland	2011	Icelandic Meteorological Office
METEOR 50DX mobile	1	UK	2011	University of Leeds
METEOR 50DX mobile	1	Japan	2011	Japan Agency for Marine- Earth-Science and Tech.
METEOR 50DX	1	Russia	2010	Hydrom. University of St. Petersburg
METEOR 50DX mobile	1	Brazil	2010	INPE, Instituto Nacional de Pesquisas Espaciais
METEOR 50DX	1	France	2009	Meteo France
METEOR 50DX mobile	4	Italy	2006	DPC Department of Civil Protection
METEOR 50DX mobile	1	Italy	2005	ARPA Piemonte

METEOR 50DX Summary

METEOR 50DX

- Medium range high-power X-Band Weather Radar System
- Doppler, Dual Polarization
- Detection of rainfall, radial wind
- Classification of rainfall intensity, type, wind, turbulence
- Compact, robust, Mobile, easy to install

Benefits

- Extremely sensitive
- High resolution
- Rapid update rate
- Precise Measurements, Tracking, Warnings & Nowcasting

Applications

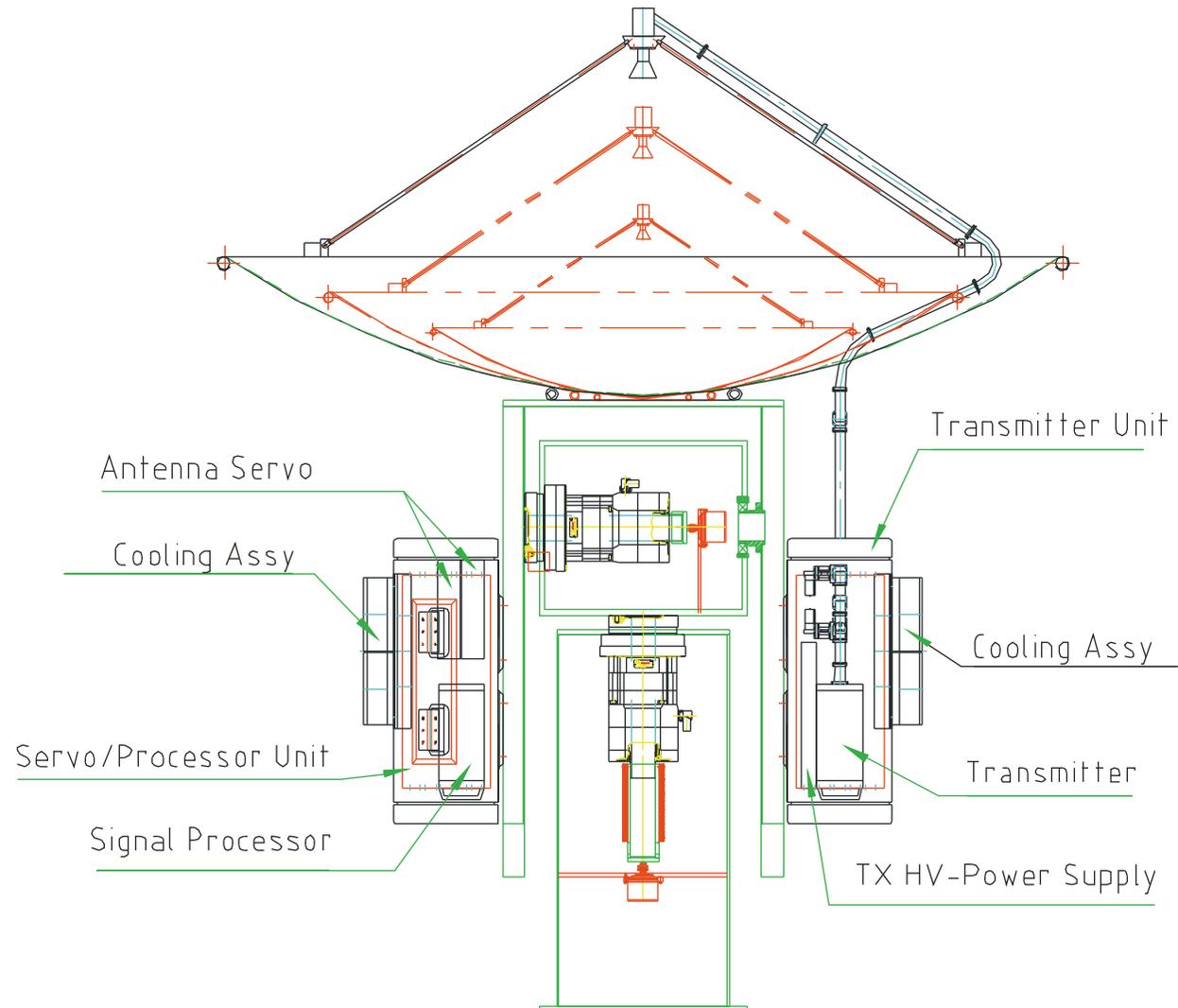
- Gapfiller in country-wide meteorological networks
- Research and temporary research campaigns
- Sensor for hydrological systems (flood/river/urban area monitoring, water reservoirs, drainage systems)
- Sensor for aviation met systems in the terminal area (hazardous weather, wind shear, gusts)

Support

- Warranty (24 months)
- Training and operational support
- Tailored service contracts

METEOR 50DX

Full “Radar-over-Elevation”, no Rotary Joints



METEOR 50DX

Key Performance Parameters



Operating Frequency Range	9.36 – 9.38 GHz or 9.30 – 9.35 GHz
Peak Power (at Magnetron Output)	100 KW
Beam Width (1.8m standard)	1.3°
Antenna Gain	42.5, dB
Pulse Modes	4
Pulse Width (PW), configurable	0,33 – 2.0 μs or
Range Resolution @ Short Pulse	50 - 500 m
Pulse Repetition Frequency (PRF)	250 – 2500 Hz
Operational Range	100 km
Maximum Unambiguous Velocity @ 5:4	+/- 80 m/s
MDS @ Long Pulse	-113 dBm
Sensitivity (dBZ) @ LP& 100km	~ -11 dBZ
Sensitivity (mm/hr) @ LP, 100km	~ 0.002 mm/h

METEOR 50DX

Environmental Conditions

Specification	Value	Unit
Temperature range with radome	- 25 to + 55	°C
Temperature range without radome	- 10 to + 35	°C
Relative humidity maximum (non-condensing)	10 to 95	%
Maximum operational wind load Without radome	130	km/h
Permissible operational wind load with radome	200 In gusts	km/h
Precipitation rate	60	mm/h
Weather	Fog, rain, hail, thunderstorm	
Atmosphere	Saline, corrosive	
Installation height	Sea level to 3 km	



- **April 2013 Kick-off meeting**
- **December 2013 FAT**
- **January 2014 Delivery on site**
- **February 2014 Site Acceptance**
- **March 2014 End of Project**

potential Risks of delay due to:

- **Development of NextGen Signal Processor**
- **Infrastructure**
- **„Late“ award of contract**

RAVIS Maintenance Software

BITE – Built-In Test Equipment

Quick
Easy

Quick radar diagnostics & troubleshooting

Comprehensive analysis of all units at all detail levels

Klystron > 500 BITE messages!

Consequent graphical, top-down visualization

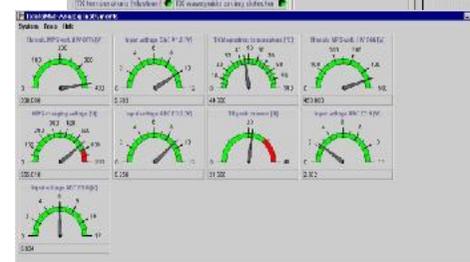
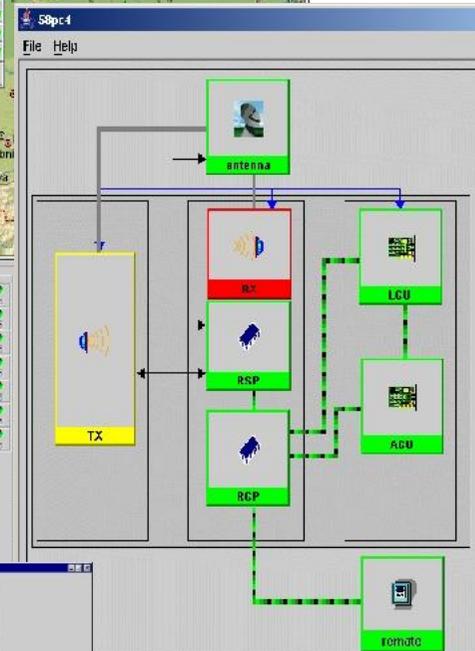
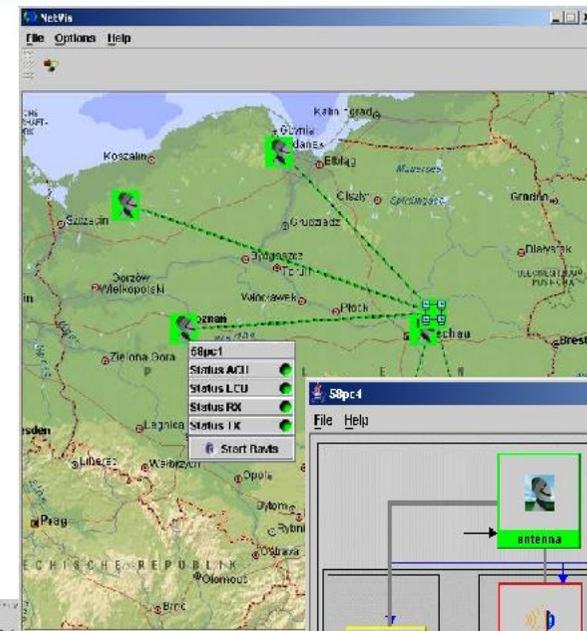
Automated (or manual), realtime, online surveillance in parallel to the running operation

Automated
Online

Textual, graphical, acoustical alerts

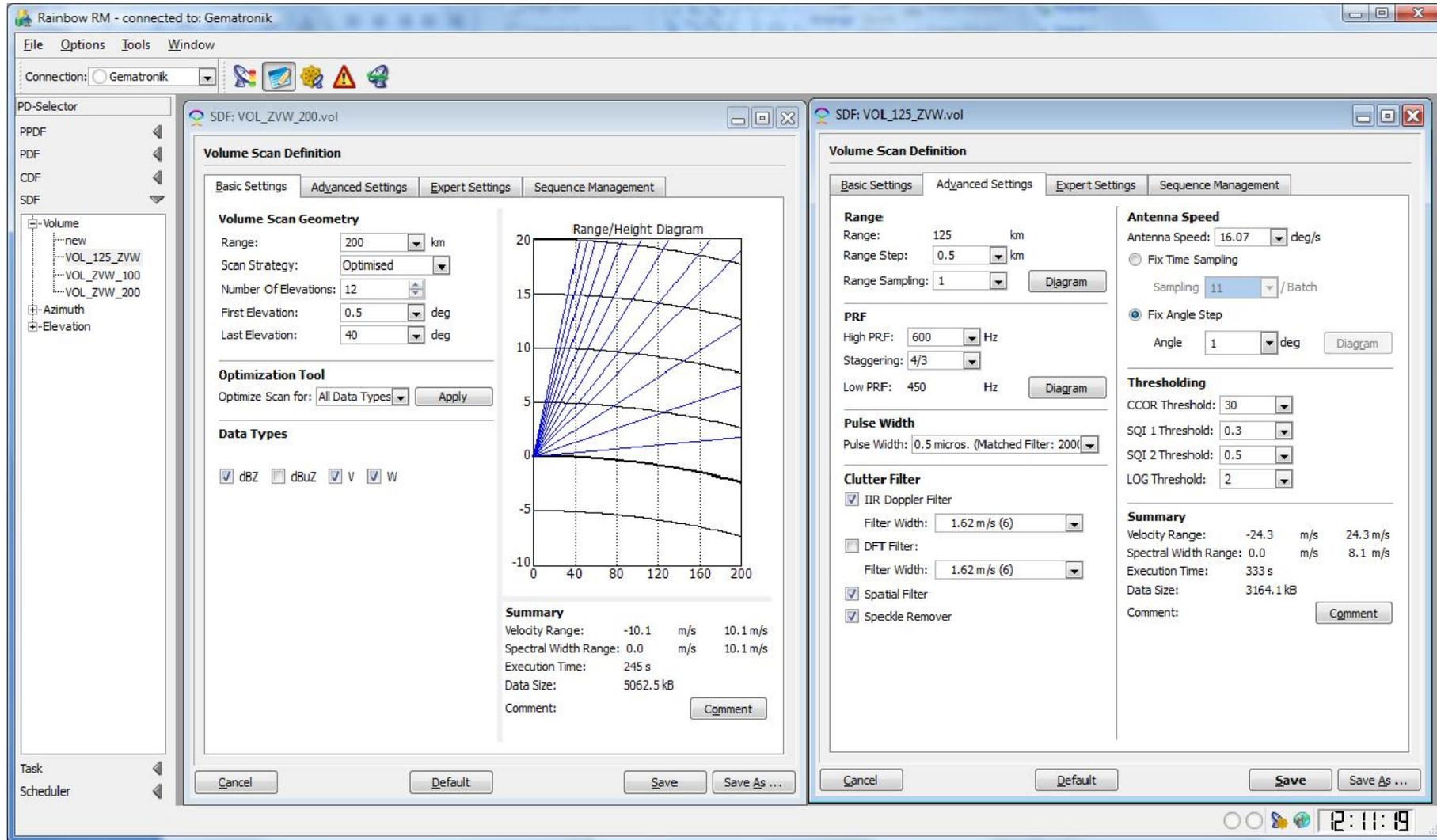
Alerting via E-mail / SMS

Easy to configure & extend



RAINBOW Display Software

Flexibility...



The screenshot displays the Rainbow RM software interface, connected to Gematronik. The main window shows two overlapping dialog boxes for defining volume scans.

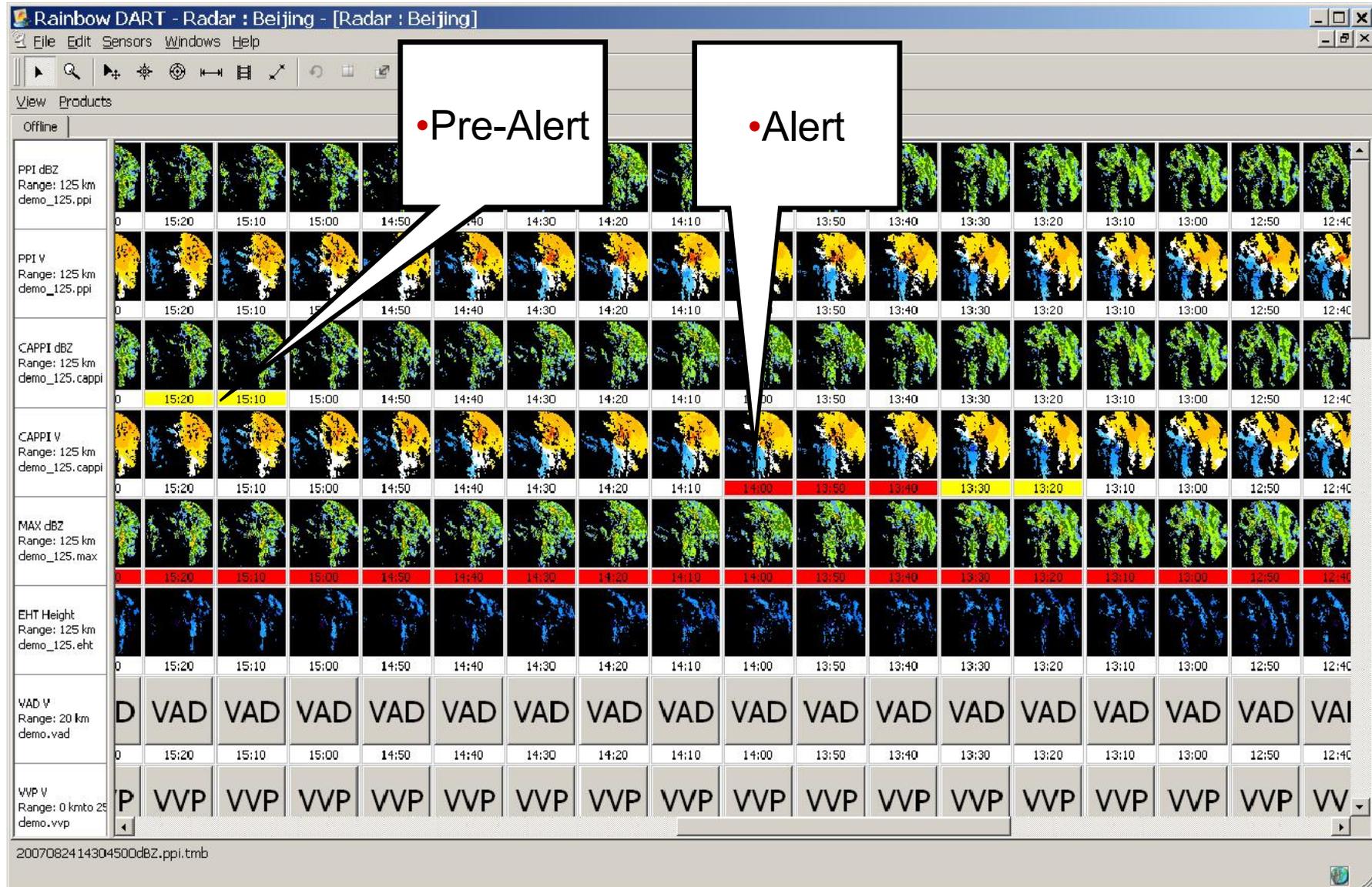
Left Dialog: SDF: VOL_ZVW_200.vol

- Volume Scan Definition** (Basic Settings tab):
 - Volume Scan Geometry:** Range: 200 km, Scan Strategy: Optimised, Number Of Elevations: 12, First Elevation: 0.5 deg, Last Elevation: 40 deg.
 - Optimization Tool:** Optimize Scan for: All Data Types.
 - Data Types:** dBZ, dBuZ, V, W.
 - Range/Height Diagram:** A plot showing scan geometry with Range (0-200 km) on the x-axis and Height (-10 to 20 km) on the y-axis.
 - Summary:** Velocity Range: -10.1 to 10.1 m/s, Spectral Width Range: 0.0 to 10.1 m/s, Execution Time: 245 s, Data Size: 5062.5 kB.

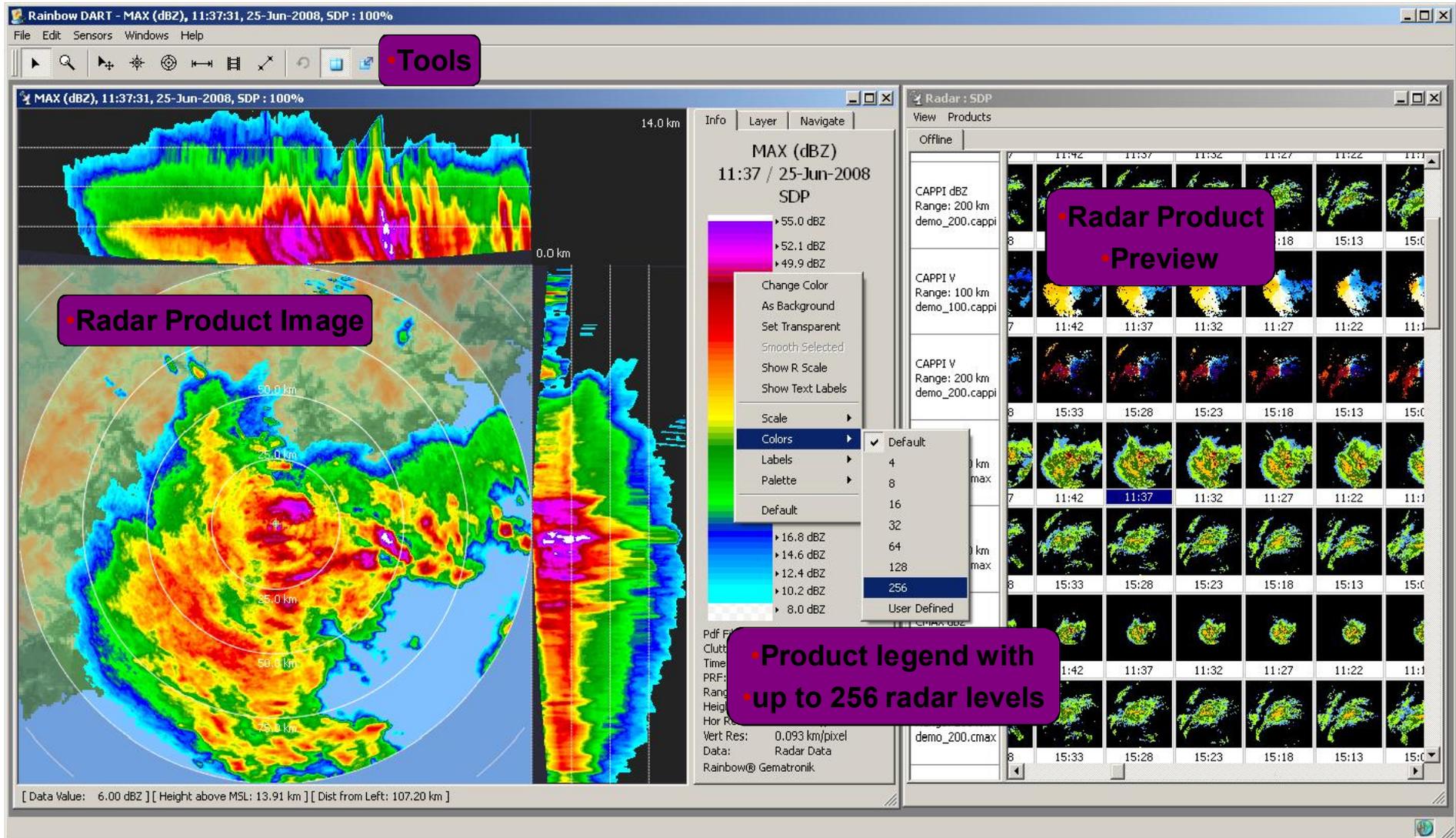
Right Dialog: SDF: VOL_125_ZVW.vol

- Volume Scan Definition** (Basic Settings tab):
 - Range:** Range: 125 km, Range Step: 0.5 km, Range Sampling: 1.
 - PRF:** High PRF: 600 Hz, Staggering: 4/3, Low PRF: 450 Hz.
 - Pulse Width:** Pulse Width: 0.5 micros. (Matched Filter: 200).
 - Clutter Filter:** IIR Doppler Filter (Filter Width: 1.62 m/s (6)), DFT Filter (Filter Width: 1.62 m/s (6)), Spatial Filter, Speckle Remover.
 - Antenna Speed:** Antenna Speed: 16.07 deg/s, Fix Time Sampling (Sampling: 11 / Batch), Fix Angle Step (Angle: 1 deg).
 - Thresholding:** CCOR Threshold: 30, SQI 1 Threshold: 0.3, SQI 2 Threshold: 0.5, LOG Threshold: 2.
 - Summary:** Velocity Range: -24.3 to 24.3 m/s, Spectral Width Range: 0.0 to 8.1 m/s, Execution Time: 333 s, Data Size: 3164.1 kB.

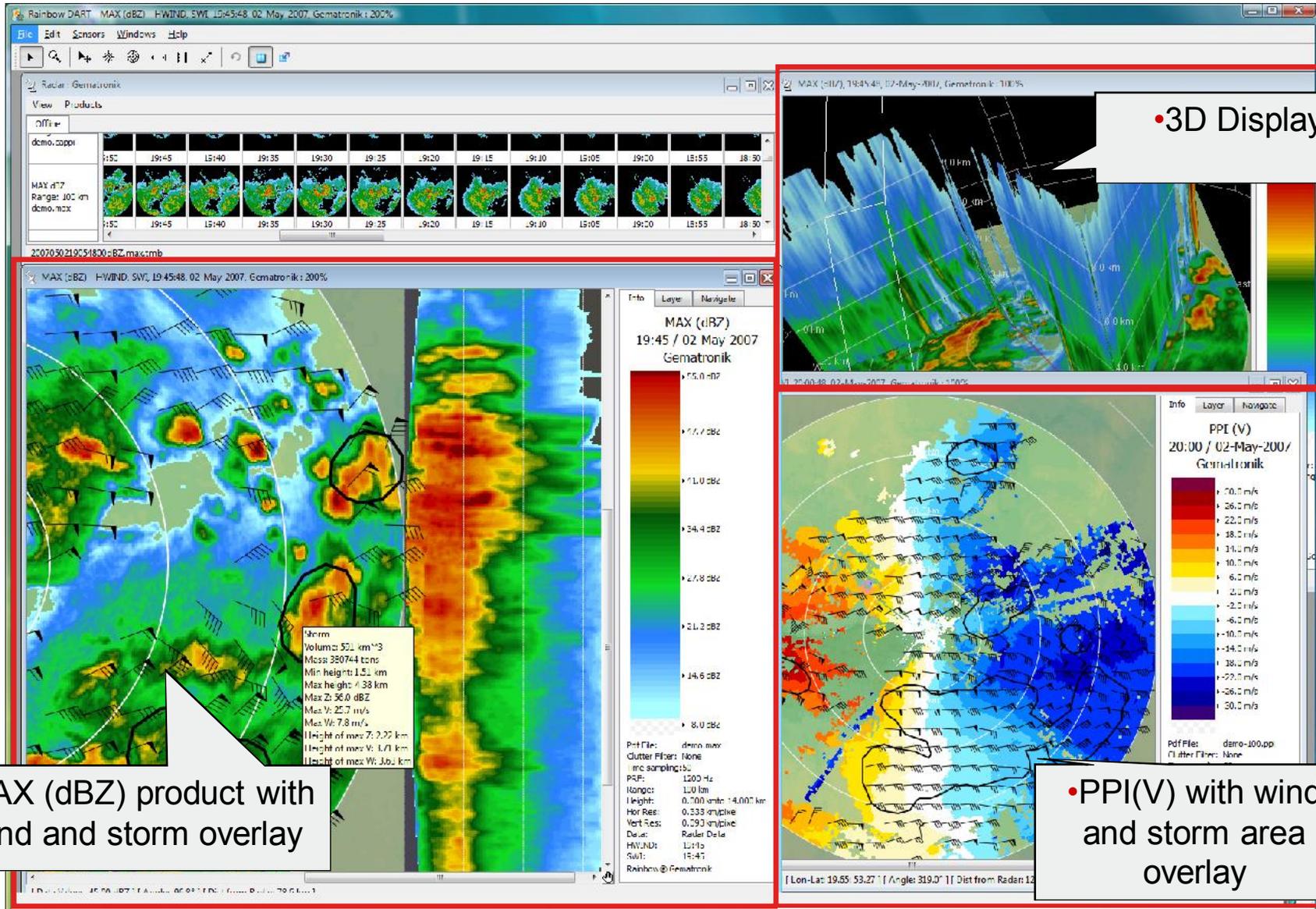
Product Preview



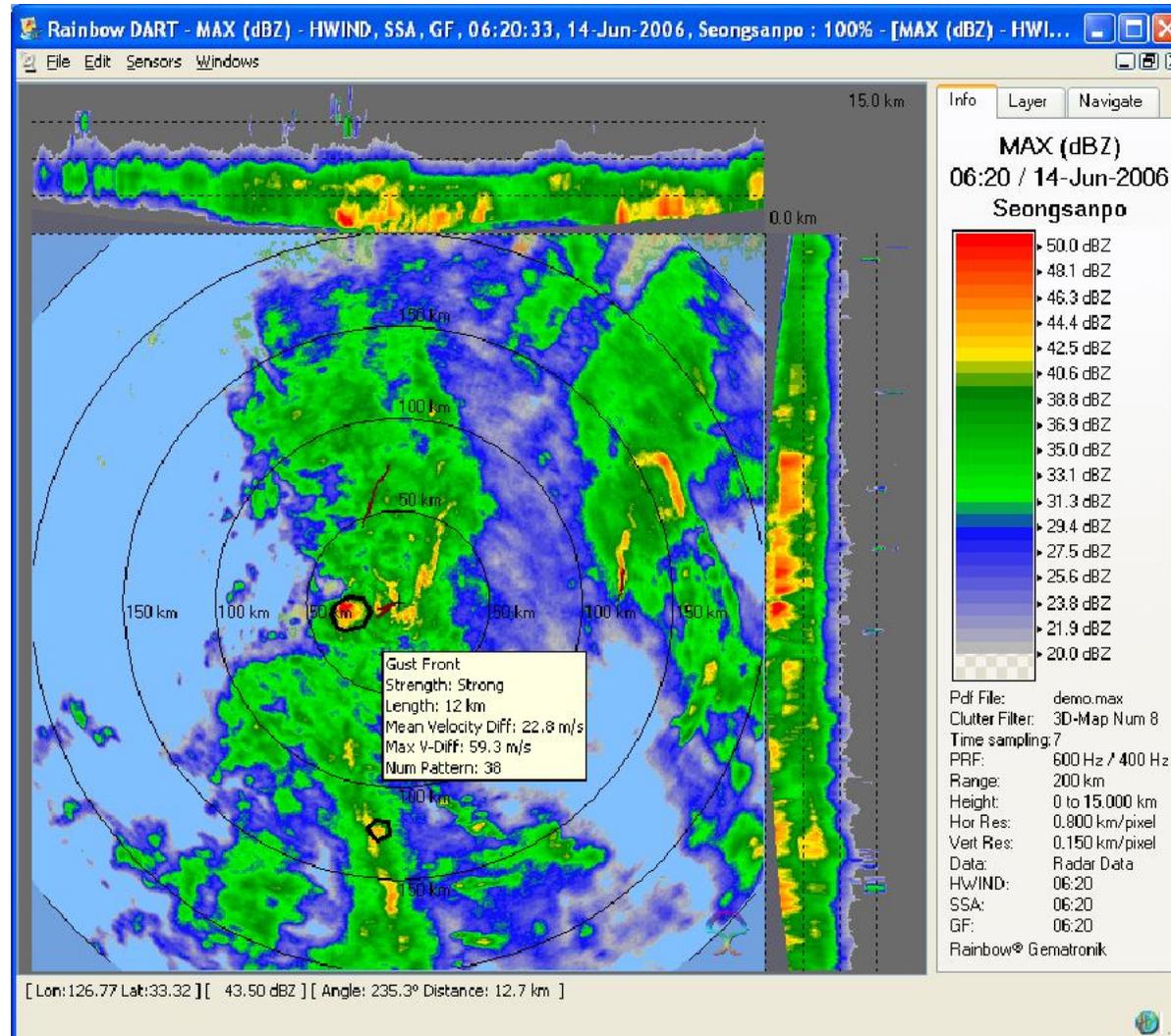
Rainbow DART Product View



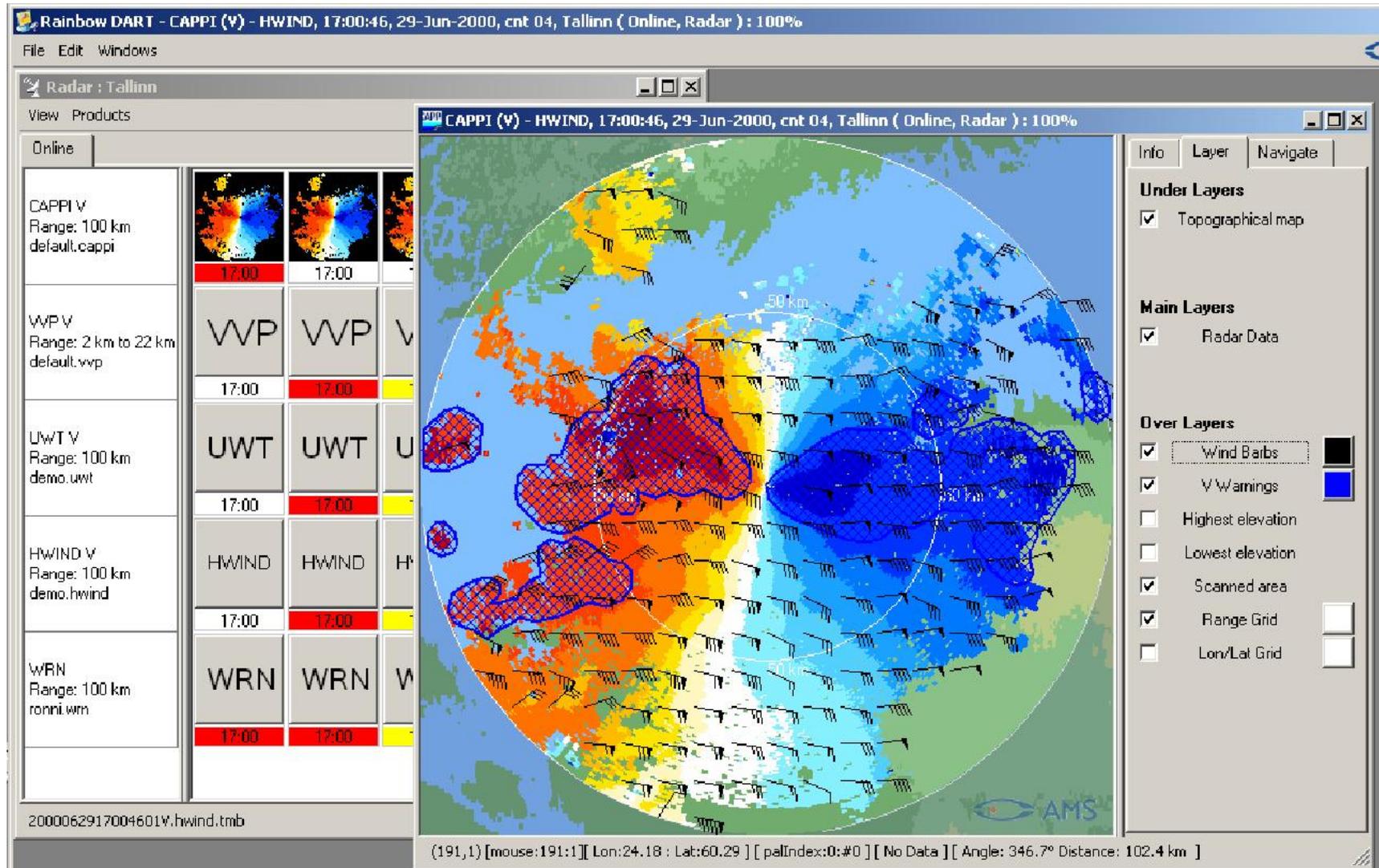
Rainbow DART Product View



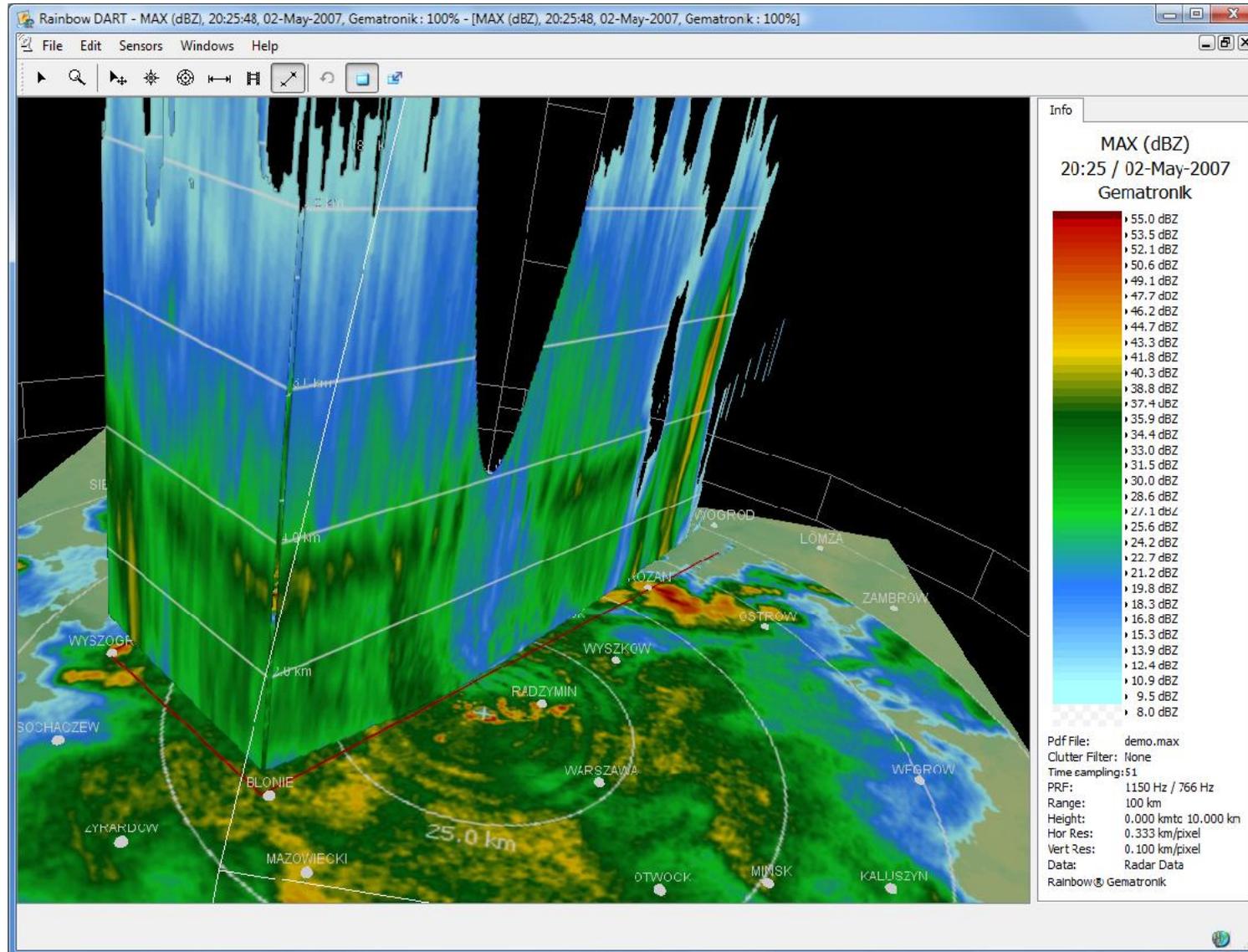
Typical Reflectivity Product



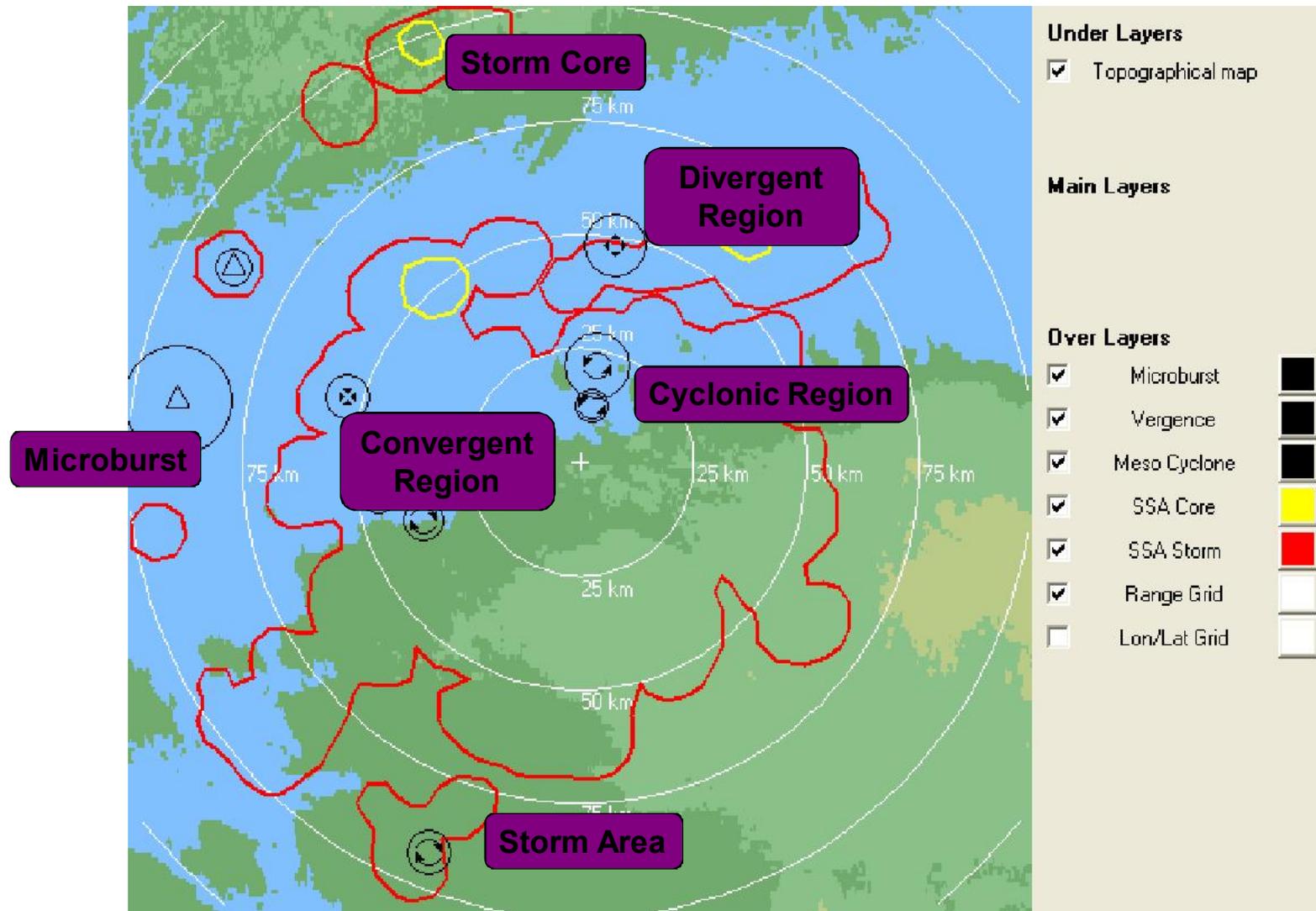
Velocity Product with Wind Overlay



3D Analysis of Convective Systems



Symbols for Severe Weather Phenomena



METEOR 50DX



- Location: France, Sait-Andre-Les-Alpes
- Type: Fixed Installation
- Altitude: 1775m

METEOR 50DX



On the road in France



On the road in Libya



Off the road in Iceland



On the road in Brazil

METEOR 50DX



On the road in Poland



Special Site Inspection Nice Airport



Measurement Campaign Nice Airport



Fuel for the generator, South Africa

METEOR 50DX



Volcanic Ash Tracking in Sicily



Measurement Campaign Arpa Piemonte, Italy



Volcanic Ash Tracking in Island



50DX welcome ceremony South Africa

METEOR 50DX



Volcanic Ash Tracking in Island, Artic version, double-axis, wide-base tyre