Engineering Research Center for
Collaborative Adaptive Sensing of the Atmosphere

Puerto Rico Student Test Bed IP-3

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Overview

- Magnetron Radar
  - Radar Specifications
  - Calibration Channel
  - Corner Reflector
  - Logarithmic Detector (Video)

Student Test Bed

- Objective
  - To establish a QPE sensing network starting in the western end of the island taking into consideration coverage gaps from NEXRAD.
- Radar Sites
  - Three sites were selected based on geographical data and sociological impact. These are located in Mayagüez, Aguadilla.

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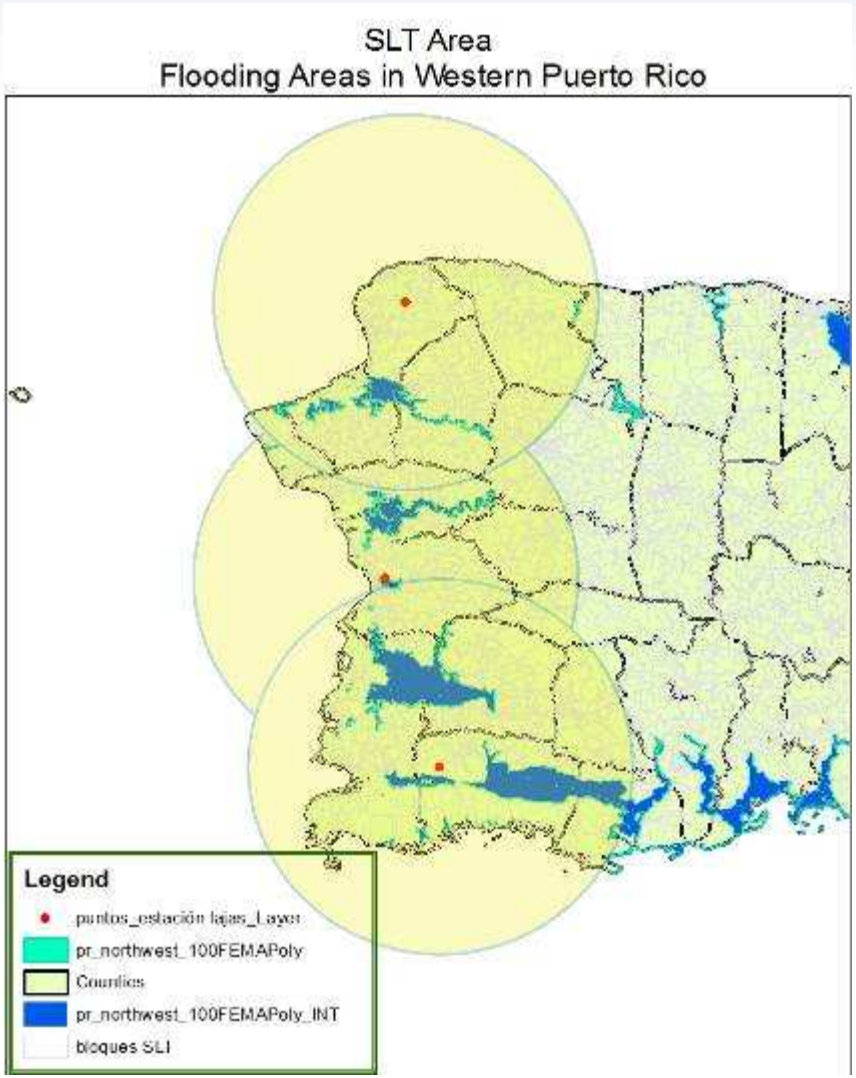
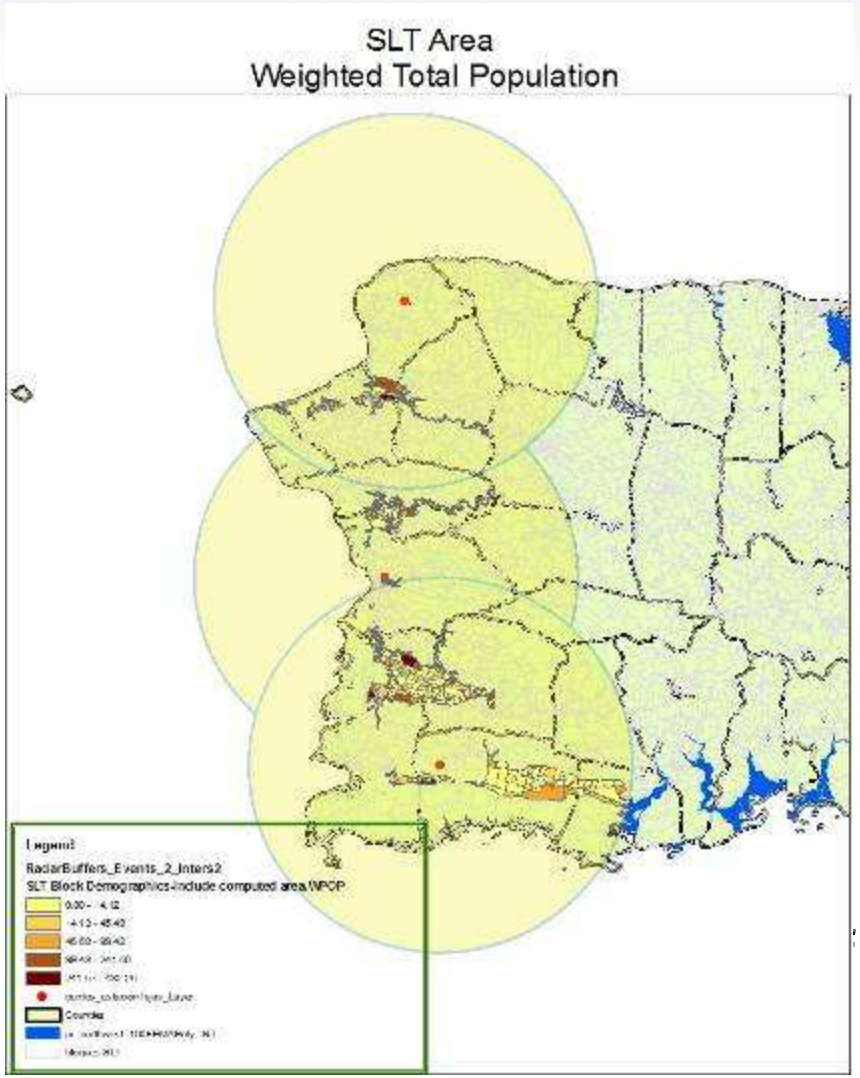
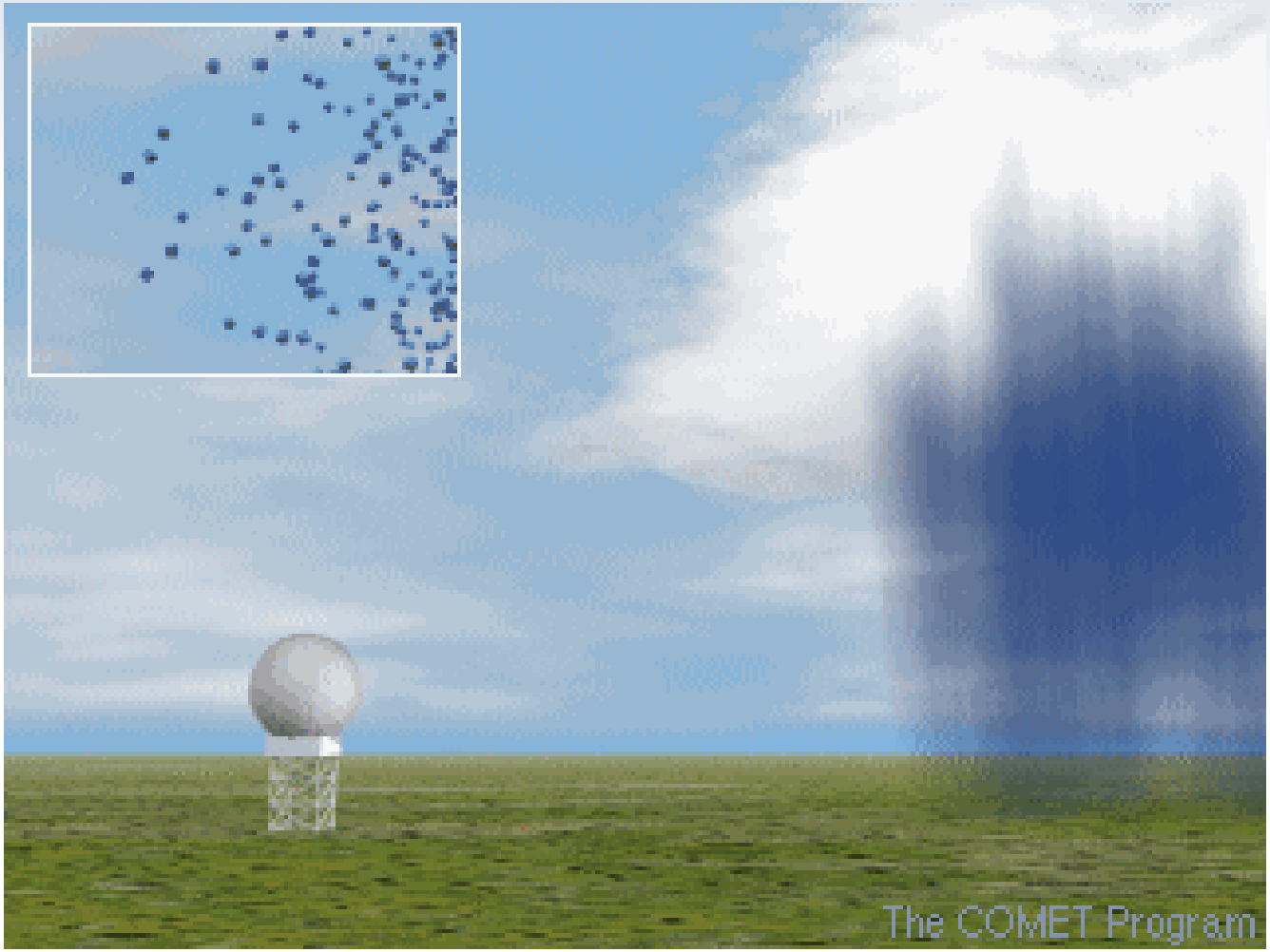
Student Test Bed





RADAR



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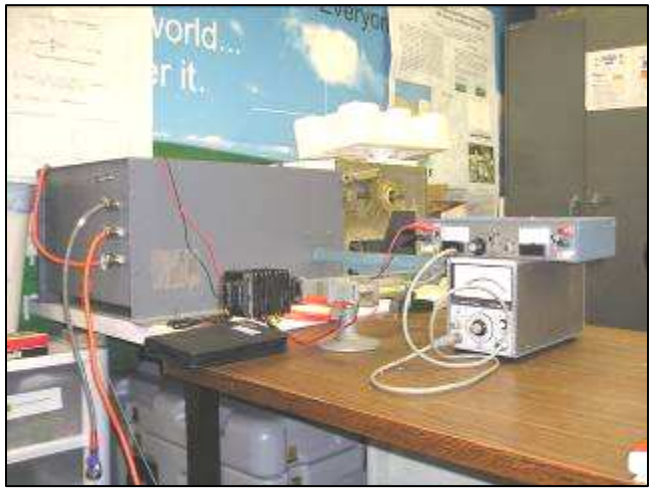
Radar Specifications

- Raytheon Marine X-Band Radar
- Single Polarization
  - Magnetron
    - F = 9.41 GHz
    - P_{peak} = 25 kW
    - Duty $Cycle_{max}$ = 0.001



Radar Specifications

- Modifications
  - Antenna
    - 1.22m Parabolic Dish
    - G = 38 dB
    - 2.0° HPBeamwidth
  - Spinner
    - Originally 25 RPM
    - Lowered to 3 RPM

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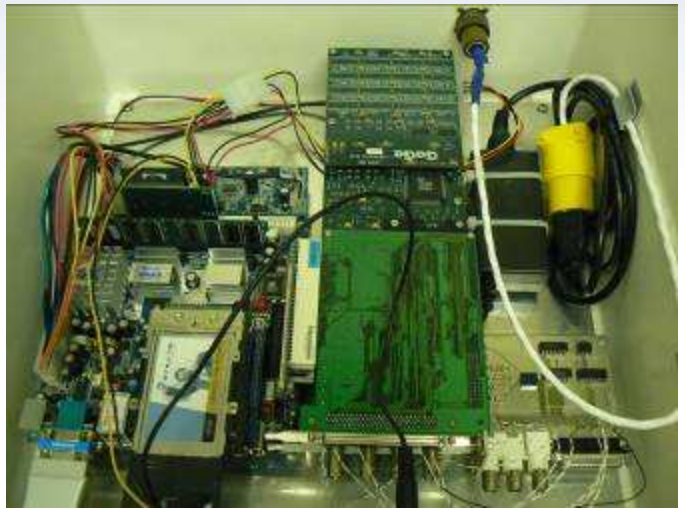
Radar Specifications

- Modifications
  - Data System
    - Linux based Mini-ITX embedded system
    - 12 Bit ADC for sampling video signal
    - 802.11b data transport to data archive server
  - Control
    - FPGA on PCI bus for timing signals and antenna position encoder data



Radar Specifications

- Location
  - Roof of electrical engineering building at UPRM
  - Waveguides already installed

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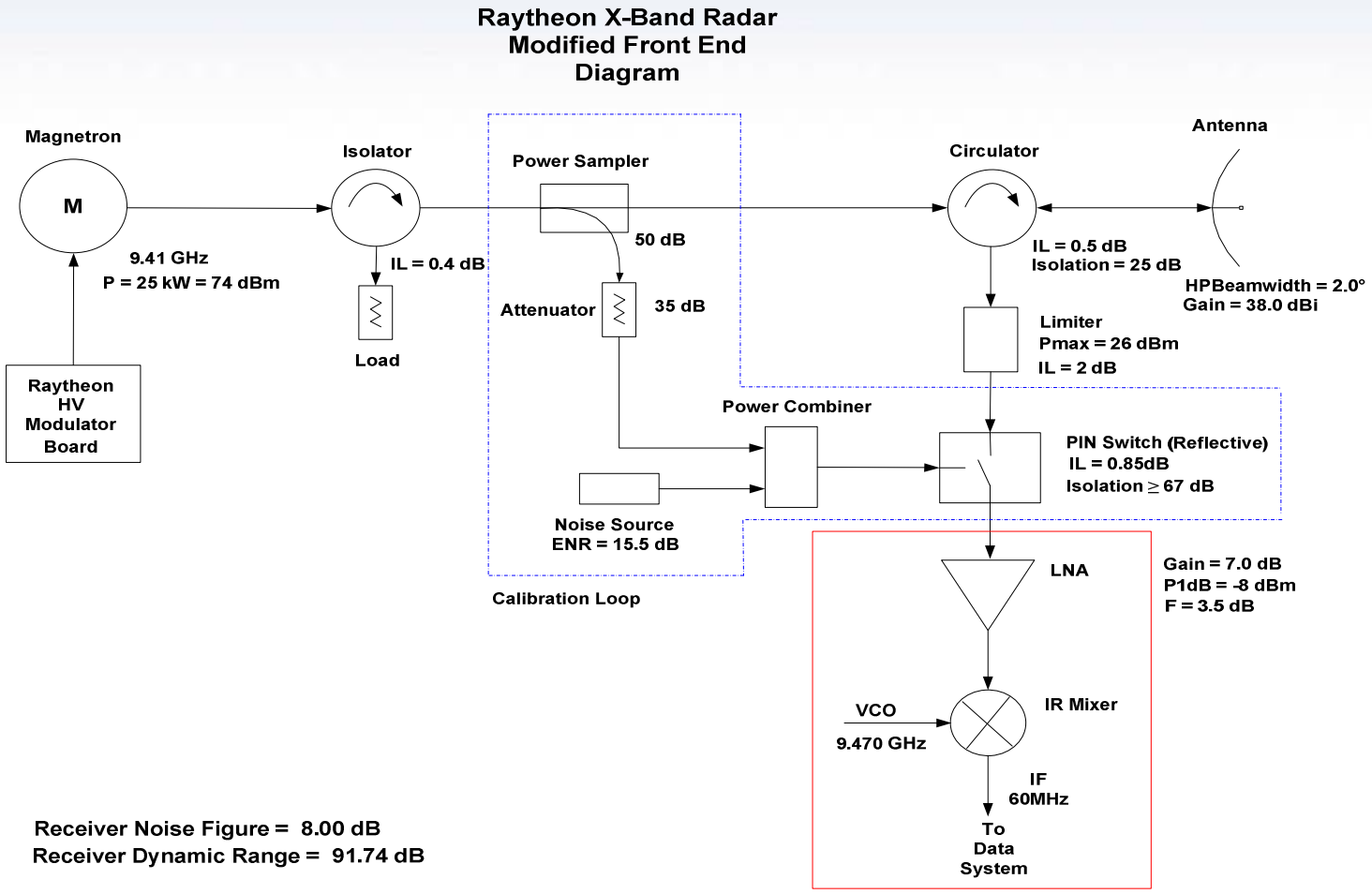
Radar Specifications



Receiver Noise Figure = 8.00 dB
Receiver Dynamic Range = 91.74 dB

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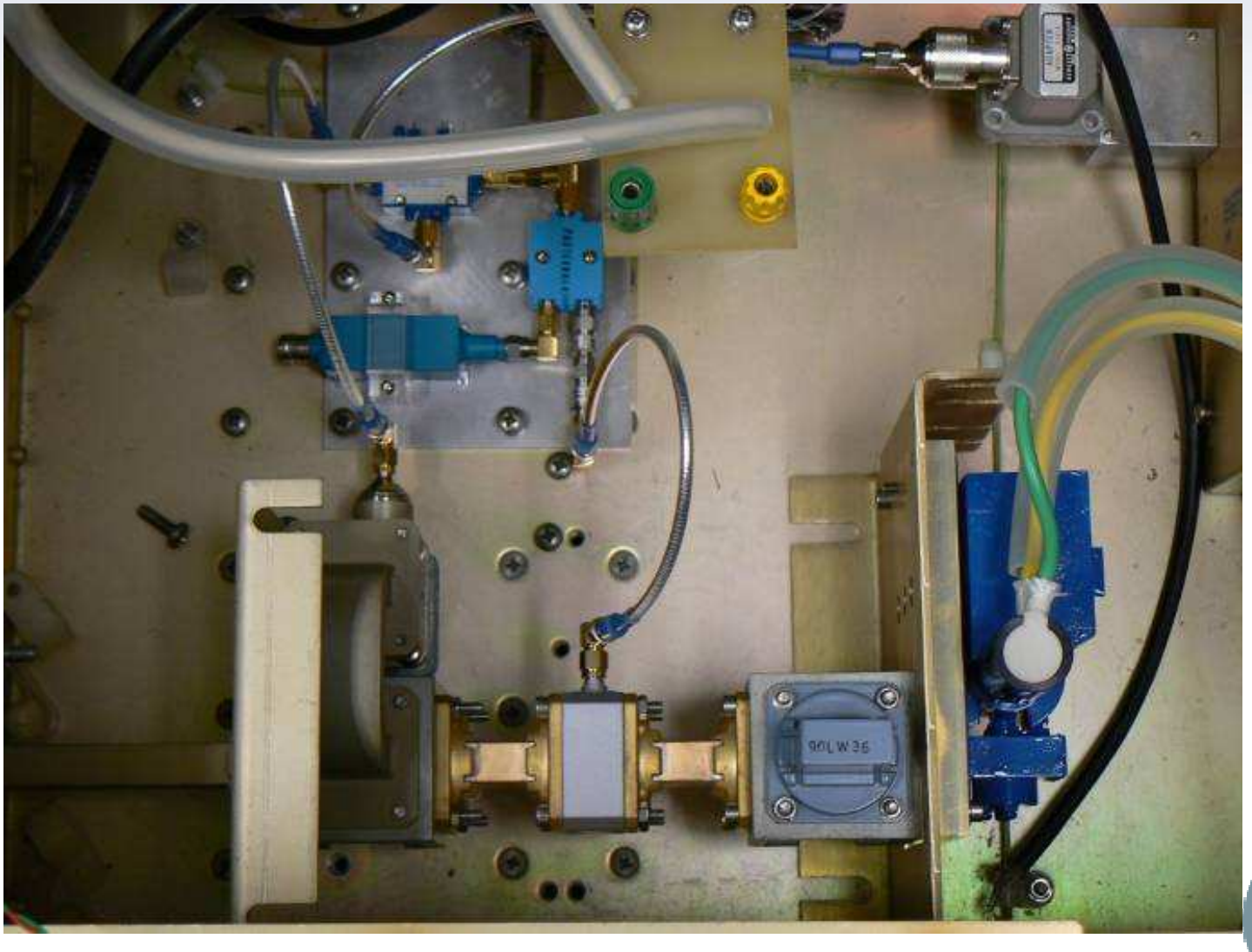
Radar Specifications



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Corner Reflector

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Corner Reflector

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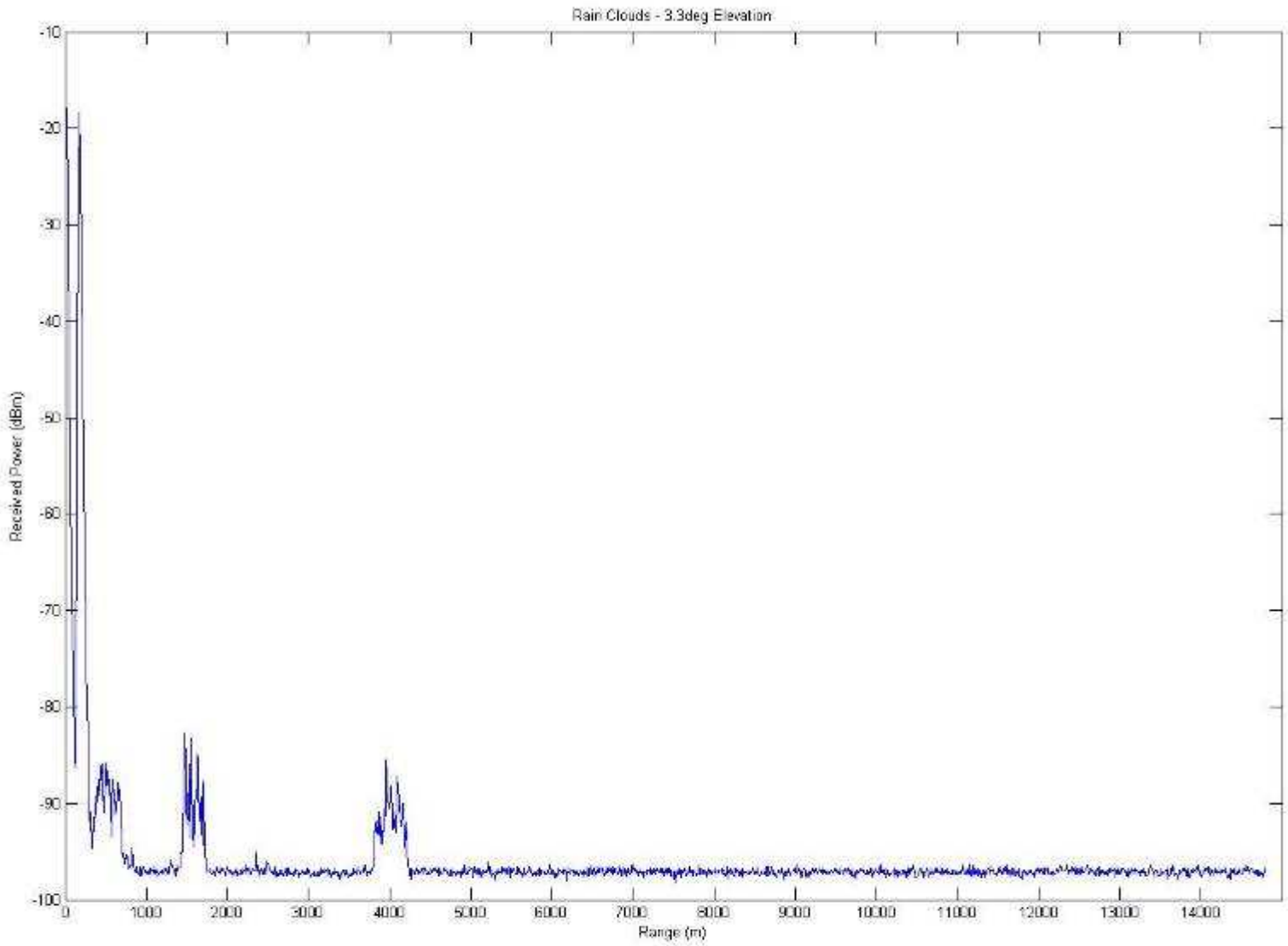
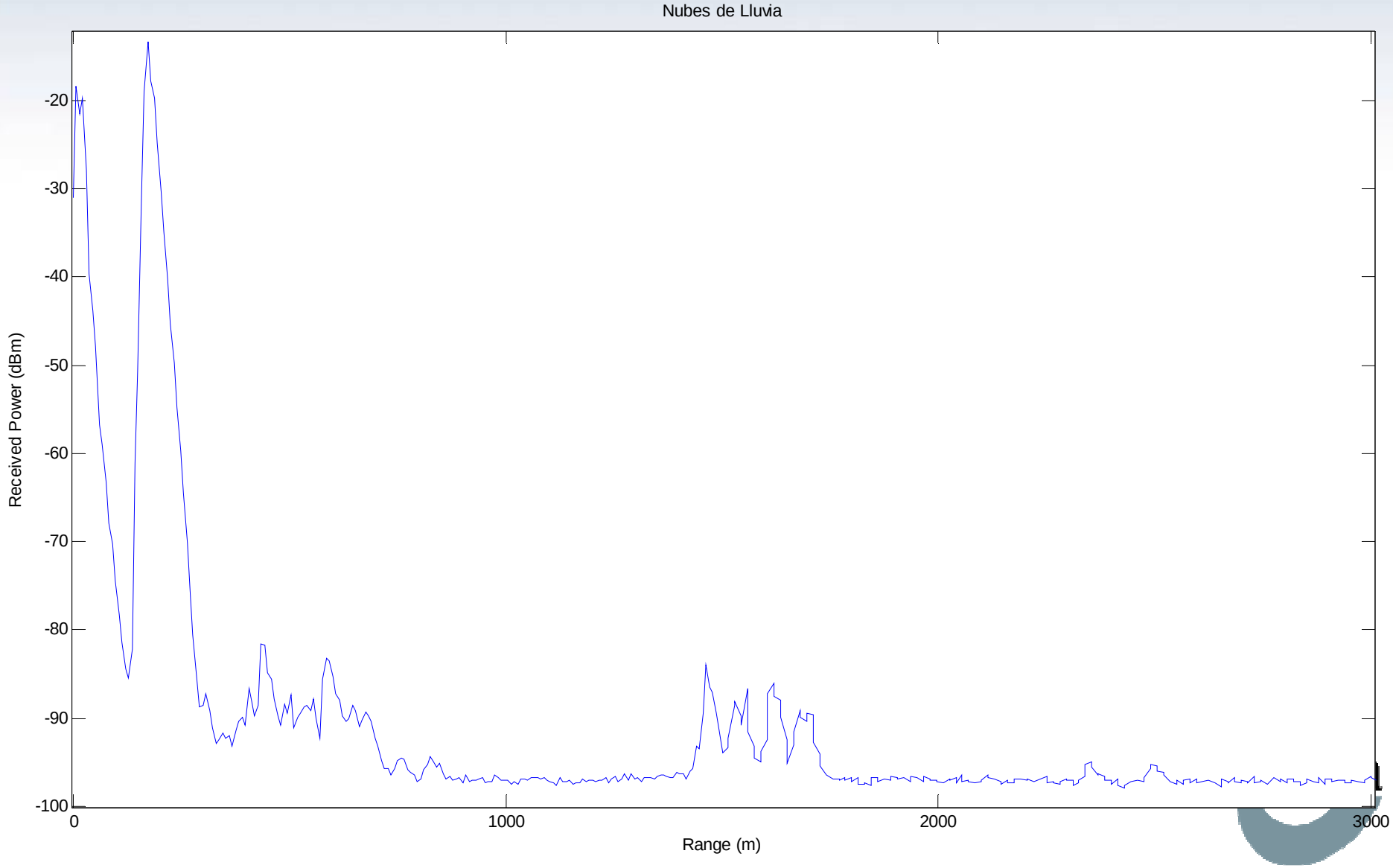
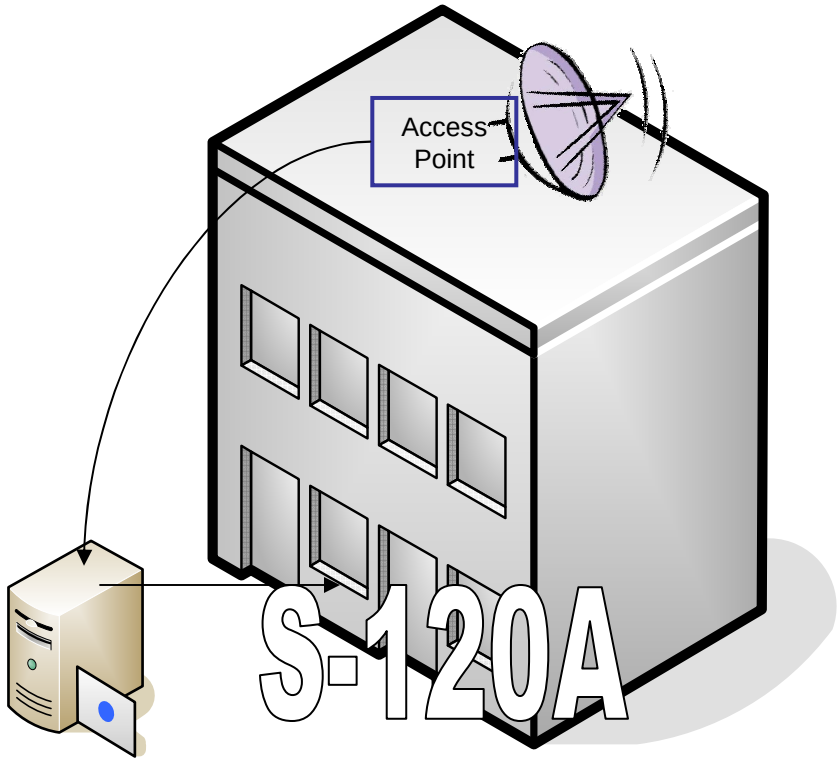
Latest Achievements



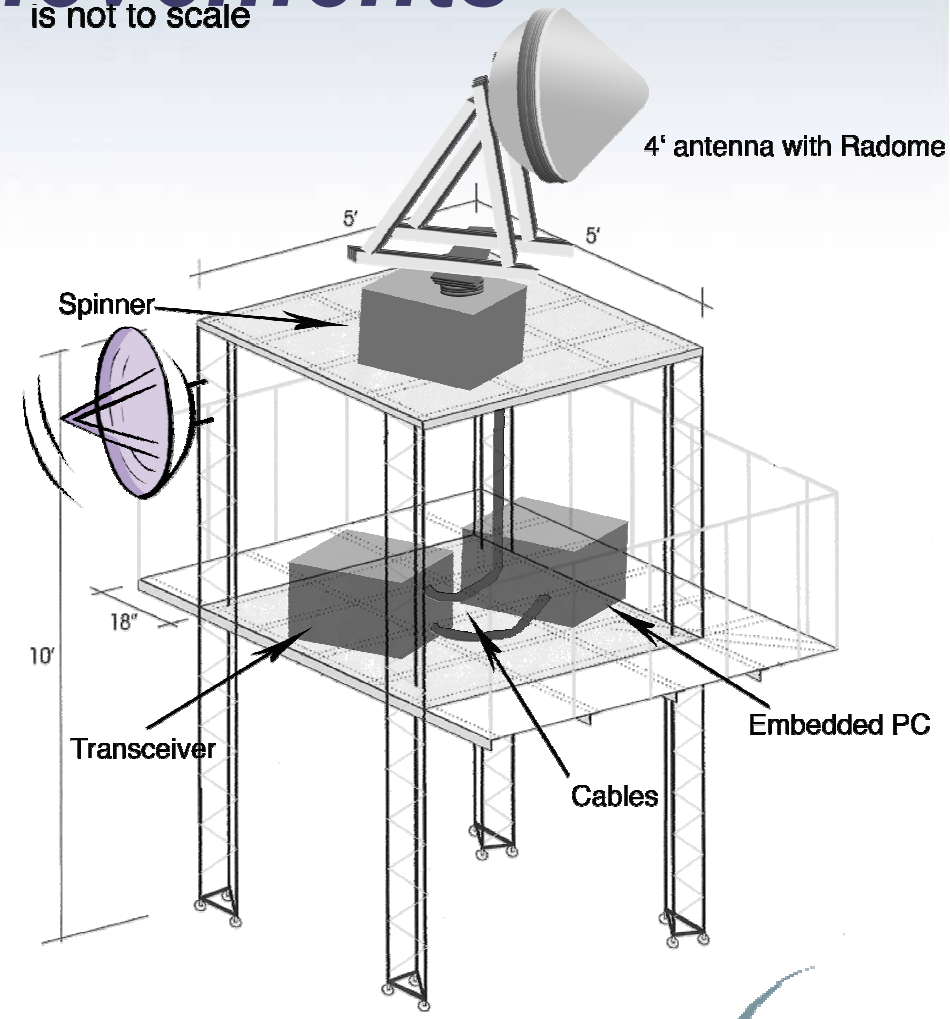
Latest Achievements



Latest Achievements



is not to scale



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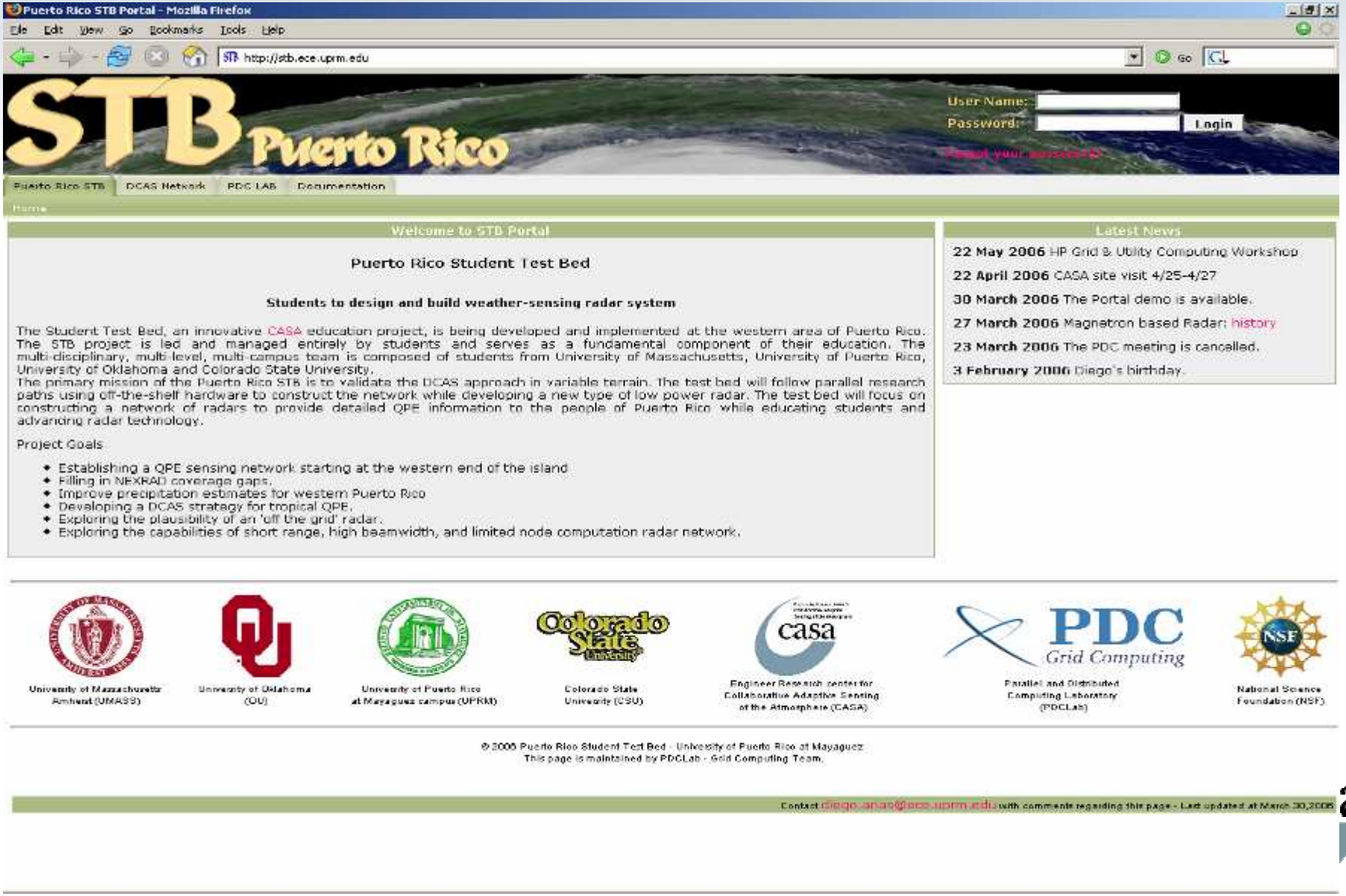

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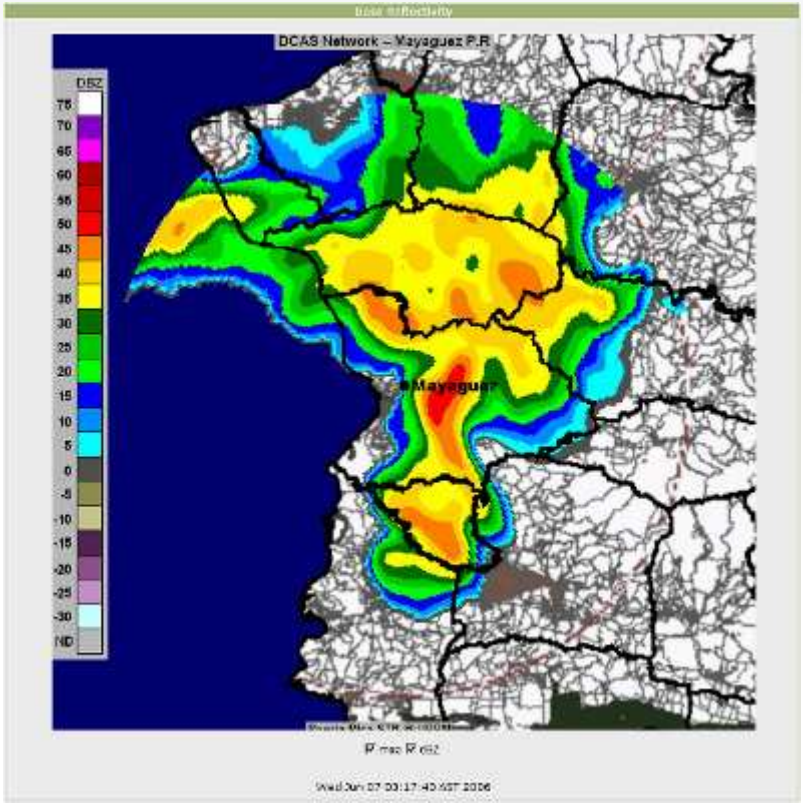

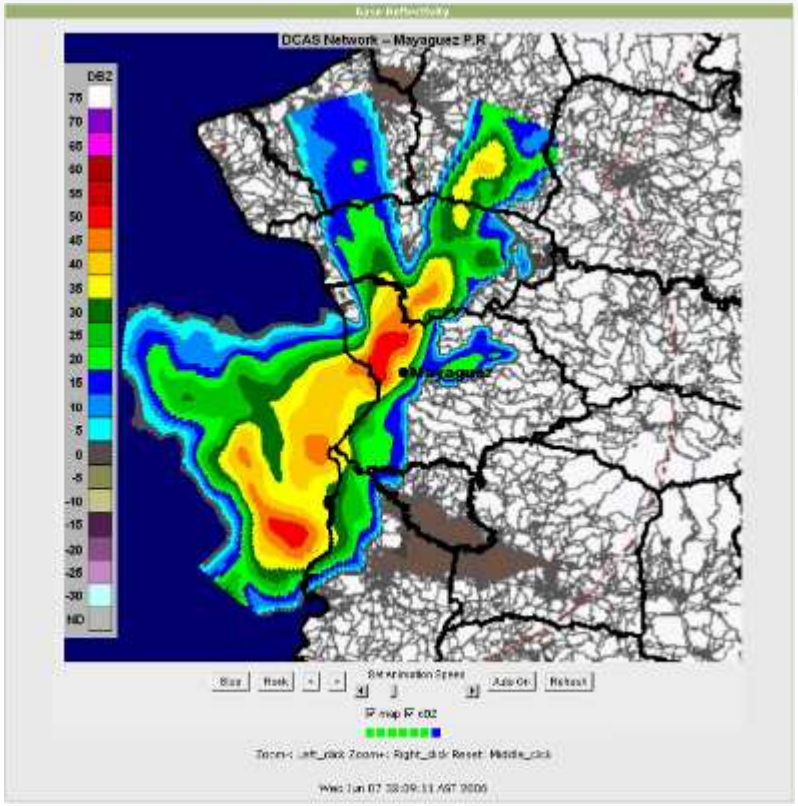

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Questions?
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