



# Digital Receiver With Interference Suppression for Microwave Radiometry

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## Objectives

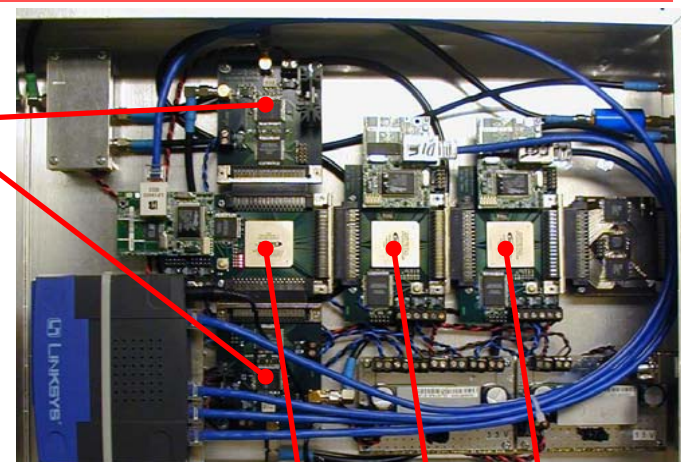
- Future sea salinity and soil moisture sensing missions use L-Band microwave radiometry
- RF interference is a major problem and limits useable bandwidth to 20 MHz.
- An interference suppressing radiometer could
  - reduce RFI effects on these systems
  - allow operation in a larger bandwidth for more accurate moisture/salinity retrievals
- Project developed a radiometer digital backend including real-time removal of time and/or frequency localized RFI sources

200 MSPS  
10 bit  
ADC's

Implemented in  
Altera FPGA's

Real-time  
"pulse blanking"  
algorithm

1K FFT = high  
spectral resolution  
RFI removal



Digital filtering/  
pulse blanking

1K FFT  
Spectral  
processing/  
integration

## Accomplishments

- Receiver prototypes developed; sample 100 MHz bandwidth with real-time pulse blanking and 1K FFT
- Demonstrated at Arecibo radio observatory and in local observations of water pool and sky targets
- Results qualitatively show significant RFI mitigation and advantages of high spectral resolution
- RFI surveys at L-band (including airborne measurements) completed under project support
- System developed can be applied in other RF bands: NPOESS sponsored project using this system at C-band in progress: results to influence CMIS design
- Proposal to utilize these technologies at L-band in the HYDROS program under evaluation

TRL<sub>in</sub> = 3; TRL<sub>out</sub> = 4



Project URL: <http://esl.eng.ohio-state.edu/~rsttheory/iip/docserv.html>

