

# Tests in Pittsburgh With Cylinder prototype

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## Outline

- June tests
- Future tests in November

21cm BAO Electronics Meeting, September 29<sup>th</sup> 2009

# Tests in Pittsburgh

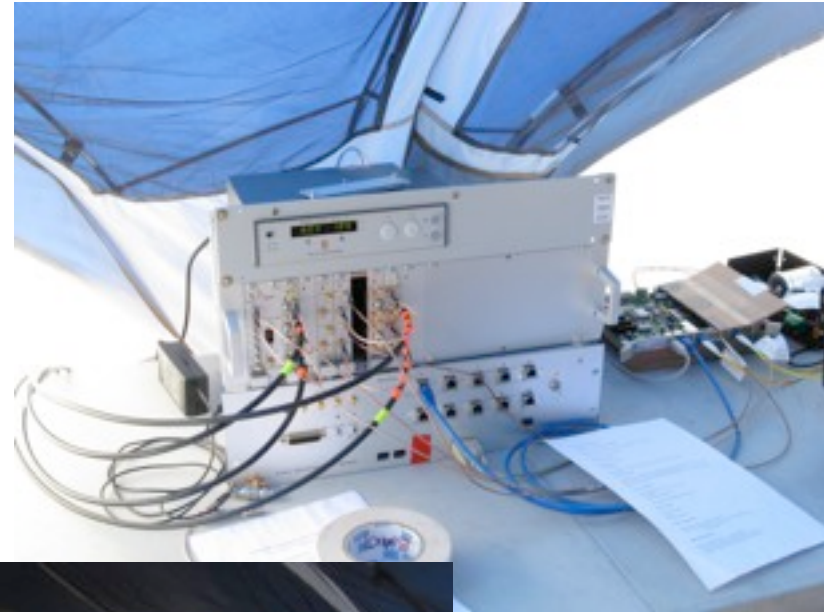
## Several test campaigns foreseen:

- **June 2009:** Correlations between 2 cylinders (4 channels)
- **Fall 2009:** North-South beam forming (16 channels)
- **Spring 2010:** 32 channels with FPGA correlators

## Strategy

- Measurements of the visibility between cylinders ( $a_1 a_2^*$ )
- Tests different firmware (with simple sampling and with FFT on board FPGA)
- Compare with or without down-conversion.

# *Electronics set up in Pittsburgh*

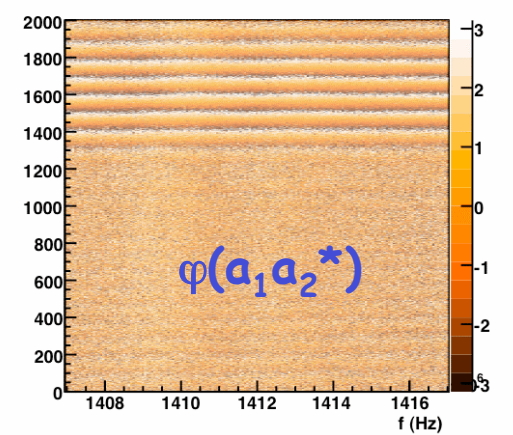
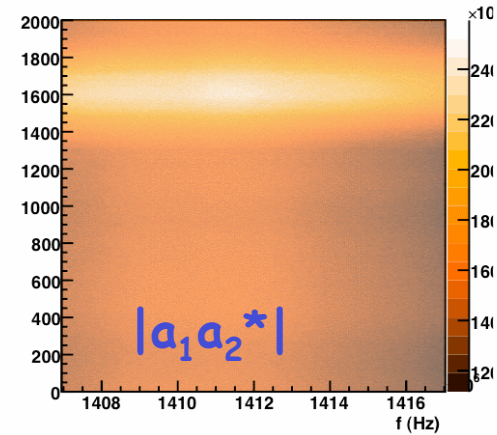
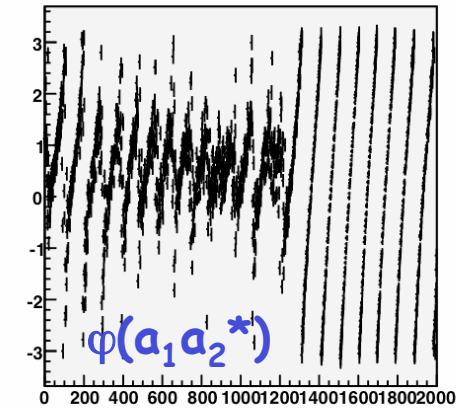
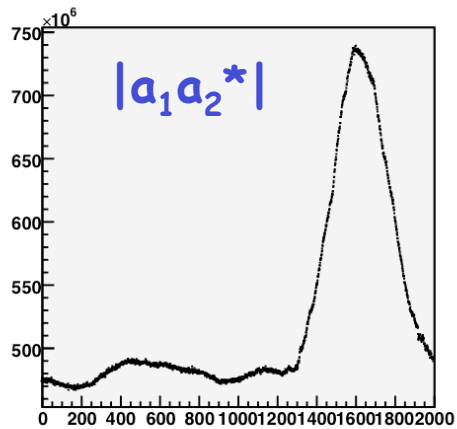
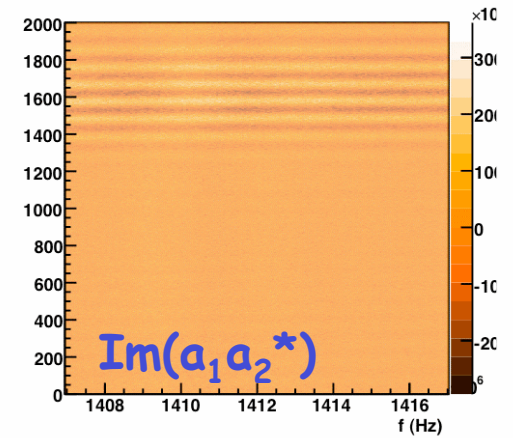
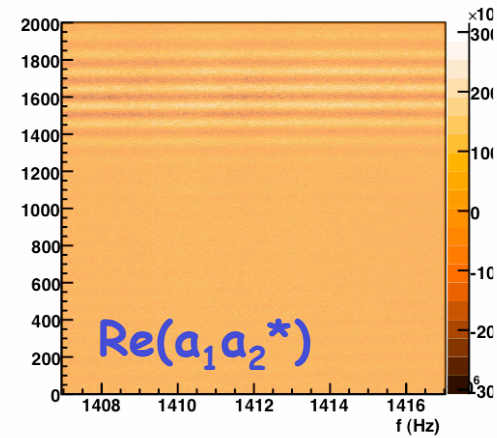
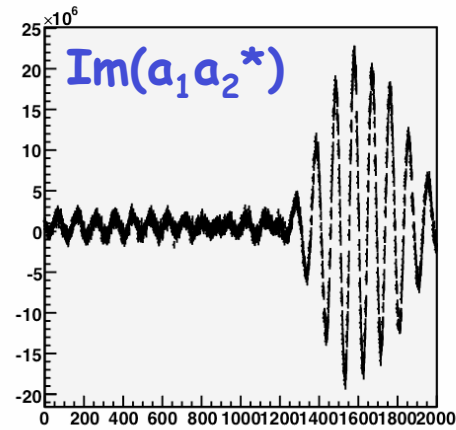
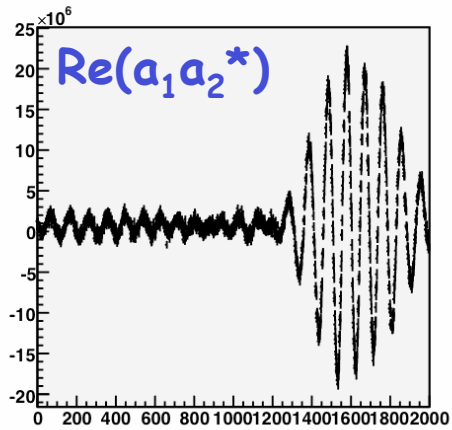


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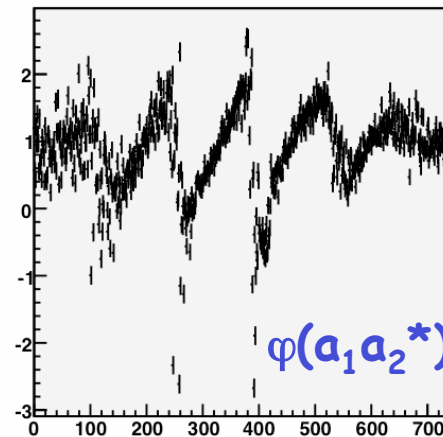
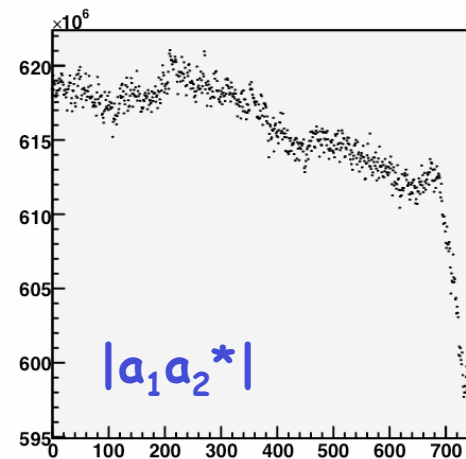
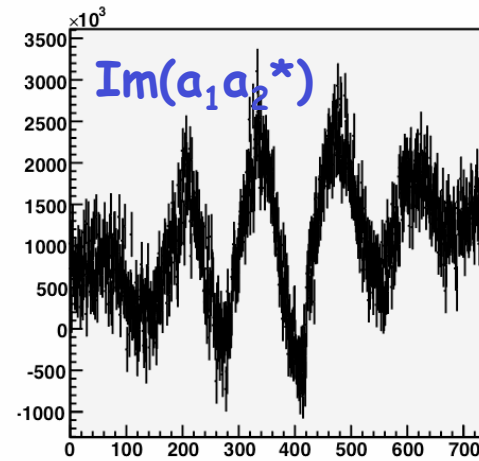
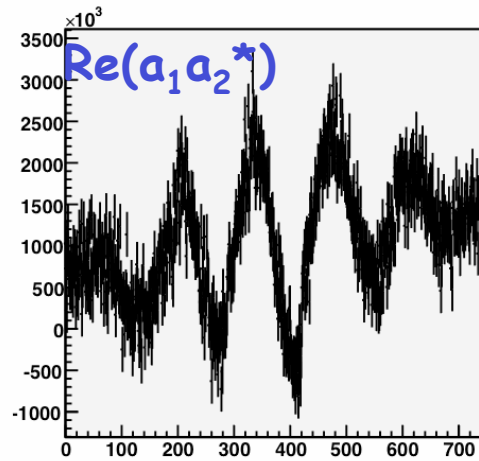
Electronics meeting

September 29, 2009

# Sun Transit with "down conversion"

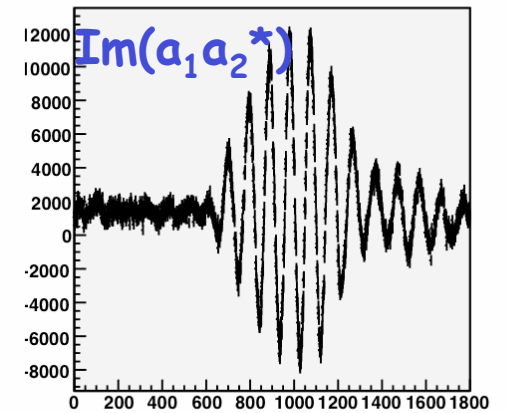
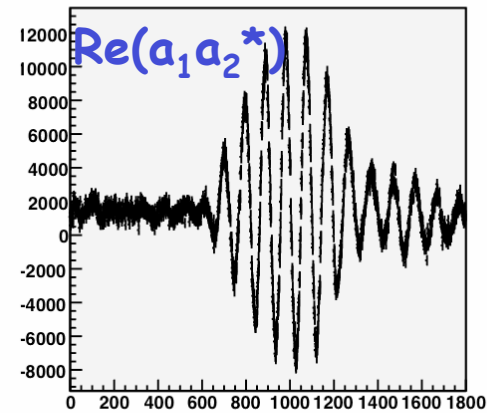
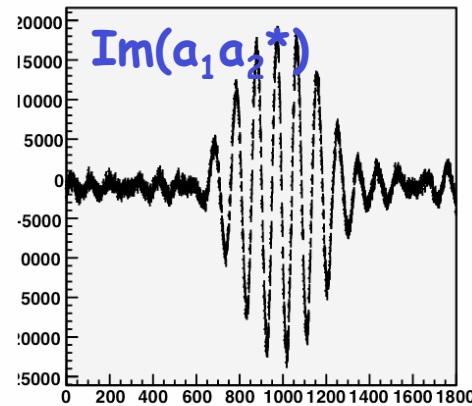
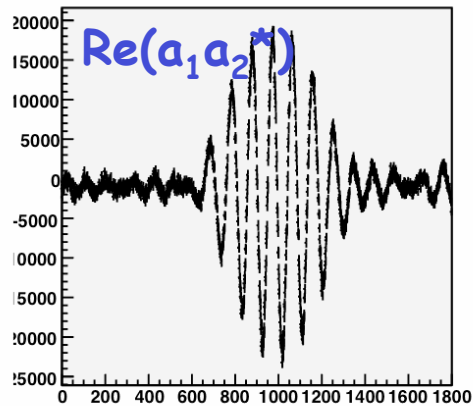


# Cas-A Transit



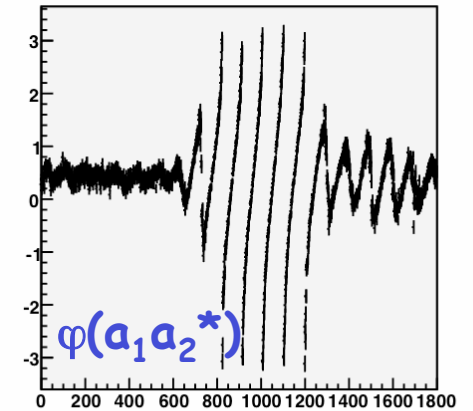
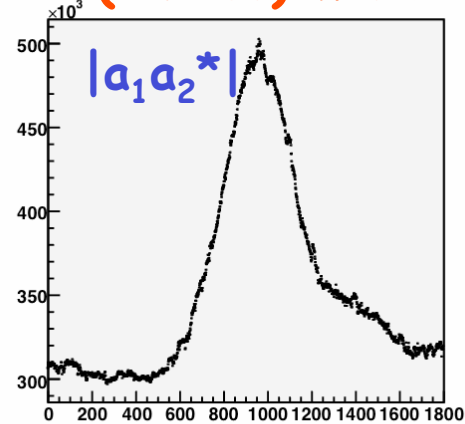
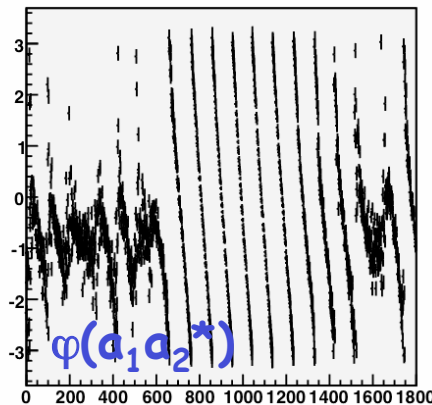
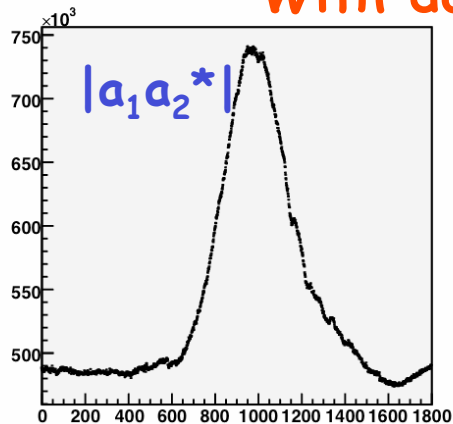


# Sun Transit with on-the-fly FFT



With down conversion

(direct) without down conversion



# Tests in November

## Goal:

- North-South beam forming (8 channels for each cylinder)
- Off-line beam forming
- On-line phase array (if correlator ready)

## Hardware:

- 16 amplifiers (25-30 db) close to feeds and dipoles
- 4 ADC boards (4 channels per board)
- 8 fibers - 4 PCI-Express (2 fibers per PCI-Express)
- 2 Servers (2 PCI-Express board per server)

# Tests in November

## Lab tests:

- 8 channels + 1 server
- Successful tests
- Reasonable read out: trigger 2KHz, useful bunches (not lost + overlap) ~ 70-80%
- Observed band in Pittsburgh : 20MHz  
⇒ Possible to improve the read out (at least to reduce data size stored on disk)
- Remaining problems with 2<sup>nd</sup> FIFO

## Next steps:

- If everybody agrees, **inform Jeff** that want to perform tests by the end of November
- **Full test in lab, Mid-October** (16 channels)



# Schedule

- **Nov. 22-27** : Tests in Pittsburgh
- **Nov. 1-6** : Shipping
- **Mid-October** : Lab tests with 16 channels (4 ADC boards and 2 servers)

Whole electronic chain (analog electronic+ADC boards (FFT)+PCI-express)

- Finalize hardware before end of October
- Development of software (firmware and acquisition) can be made till mid-November (**not mandatory**)
  - Improve read out speed
  - Fix jitter problem with 2<sup>nd</sup> FIFO
  - Fix "comb" problem