BPS Status Report

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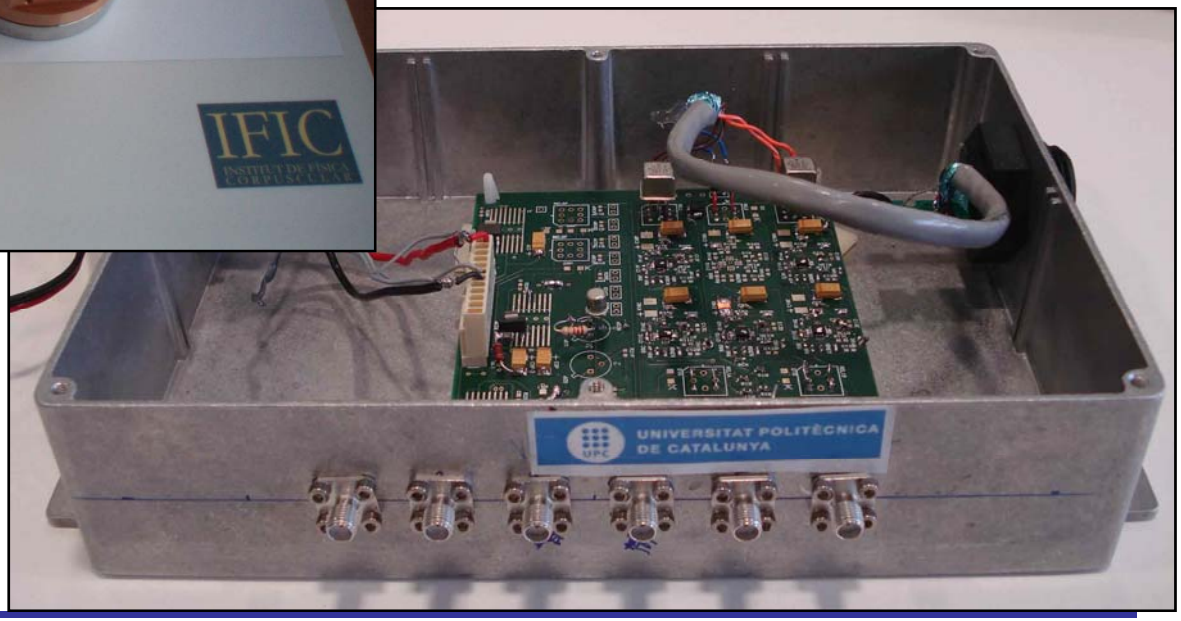
with
the help of the CTF3 team at CERN

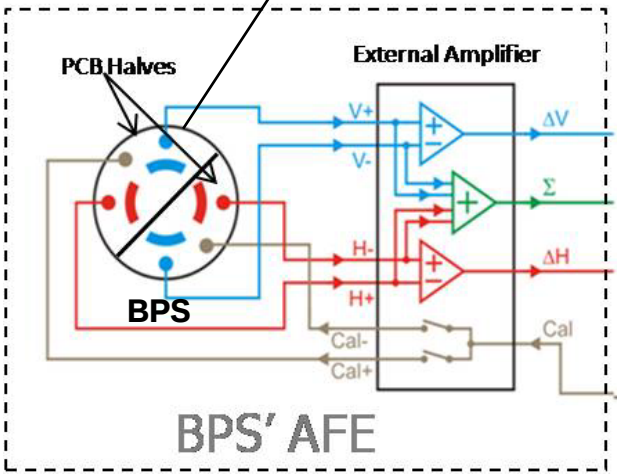
BPS Status Report

Designed and Constructed

2 BPS prototypes [IFIC]
(with PCB electronics containing sensing transformers)

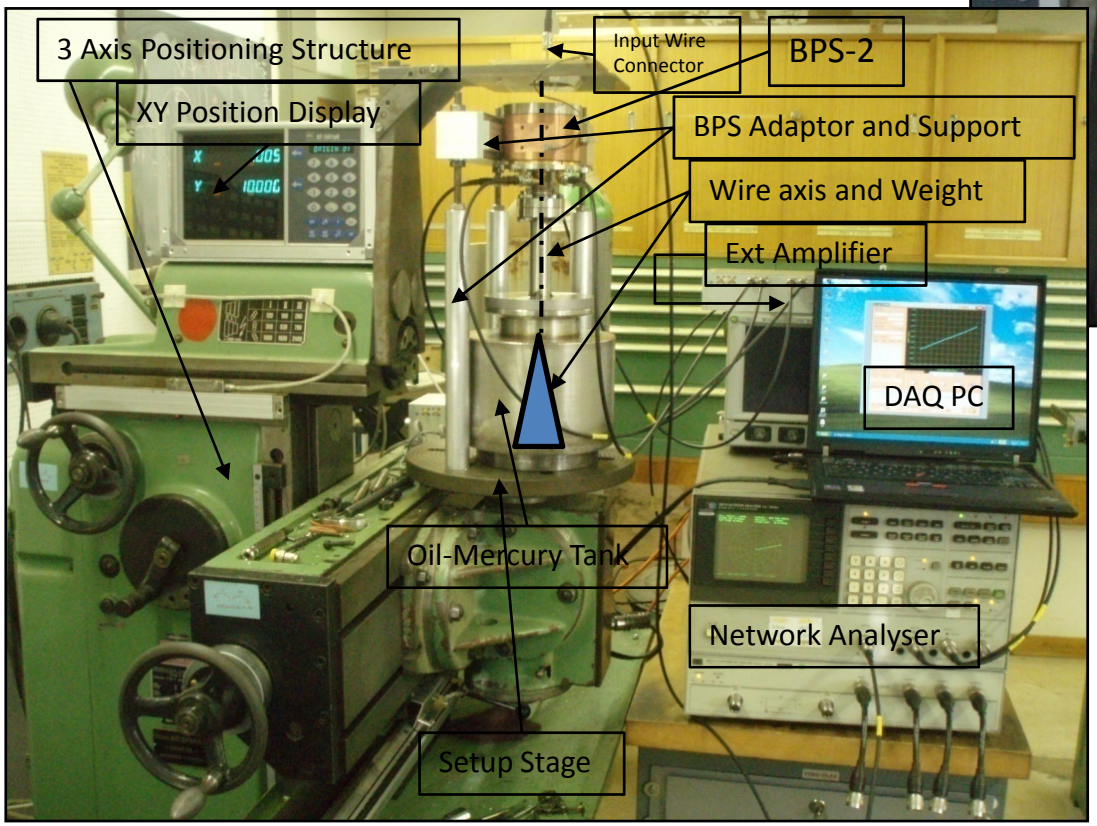
1 Analog Front End (AFE) Amplifier [UPC]

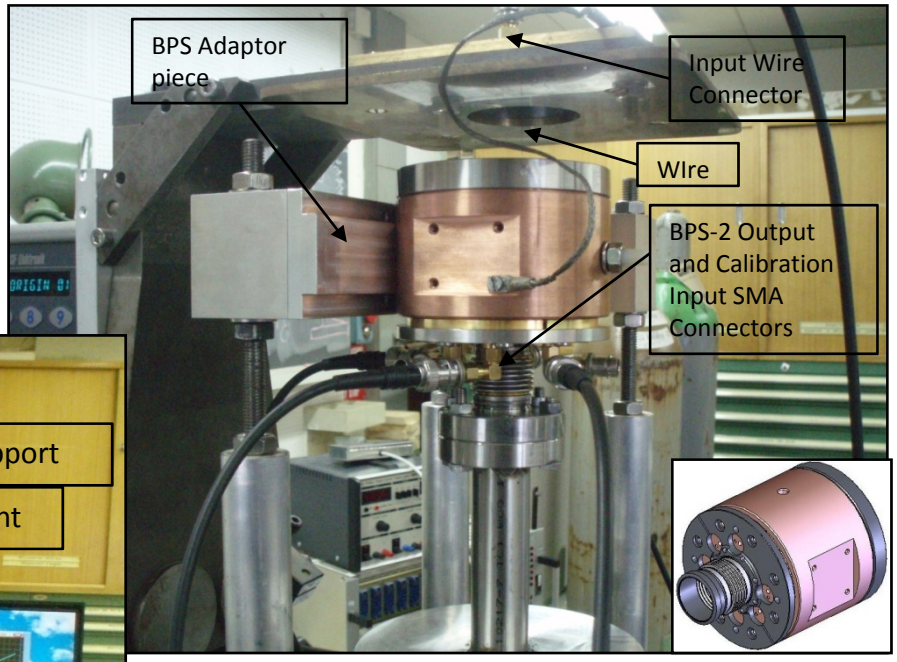




Wire Test Setup at BI-PI Lab at CERN:

BPS and Amplifier measurements performed with this setup





BPS-2 prototype in the Wire Test Setup

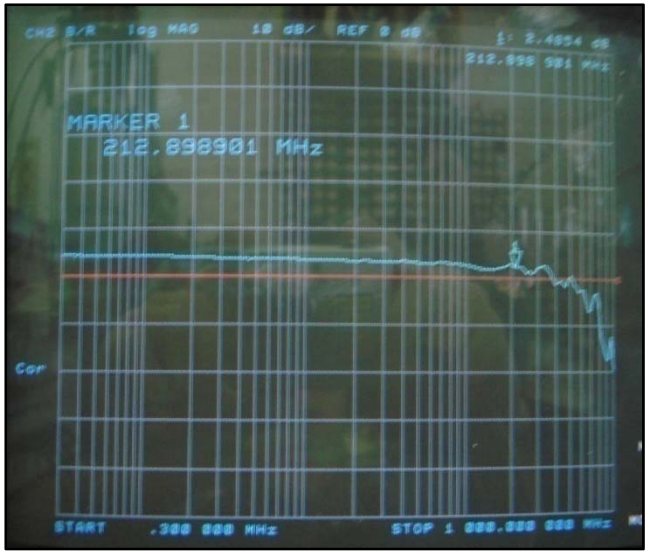
First Test Results for the AFE Amplifier

December 10th to 12th 2007

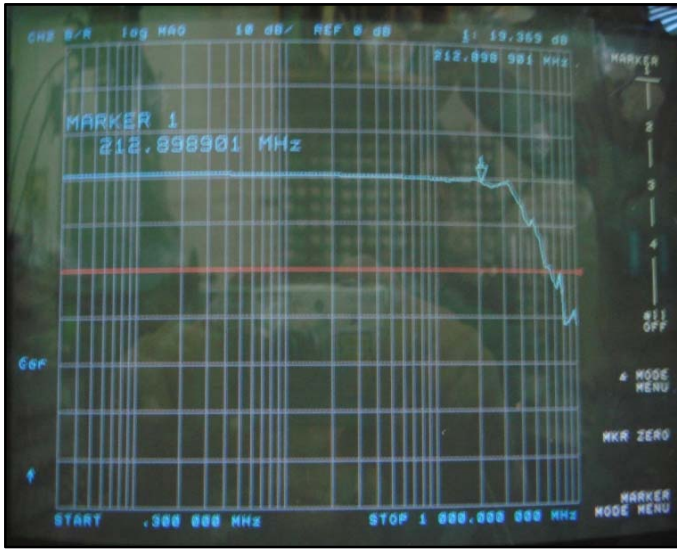
Amplifier connected to DBL-BPM in the Wire test setup

Amplifier Frequency Response

Low Gain: x1.5 of ΔH channel



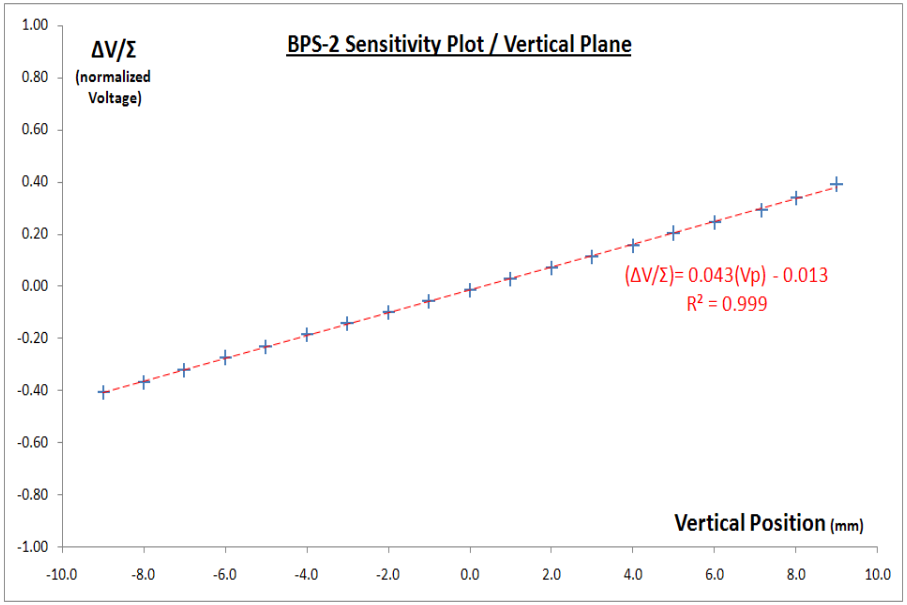
High Gain: x10 of ΔH channel

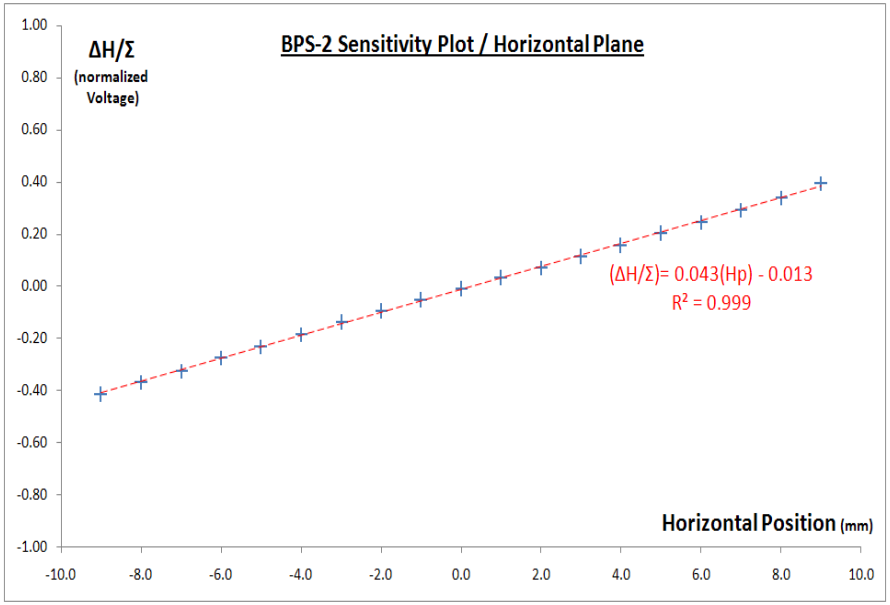


- Good Amplifier Frequency Response: above specifications: 200MHz Bandwidth
- 2 Gain scales: x1.5 and x10 for each amplifier output channel: ΔH, ΔV and Σ

First Wire Test Results for the BPS-2 prototype April 1st to 4th 2008

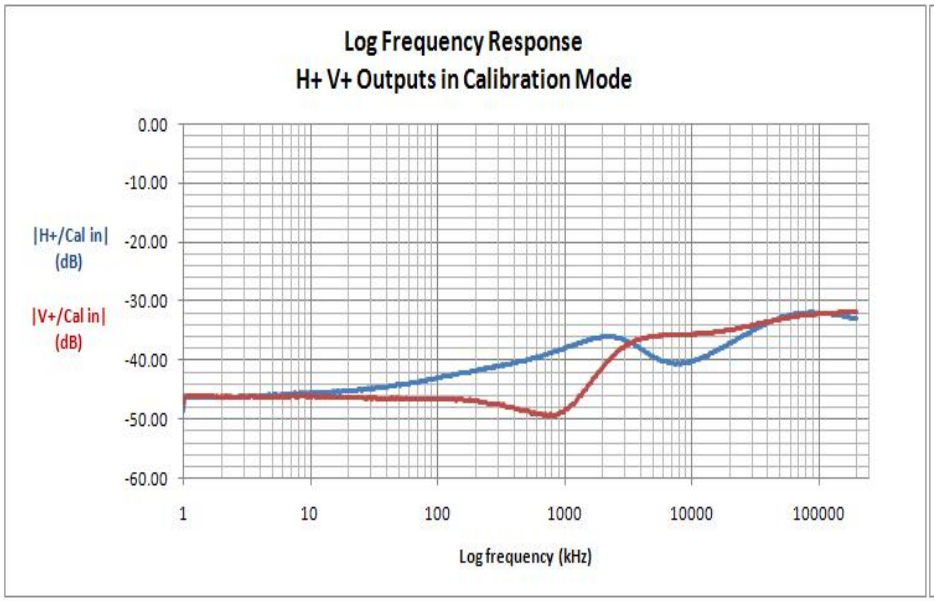
Sensitivity and Linearity

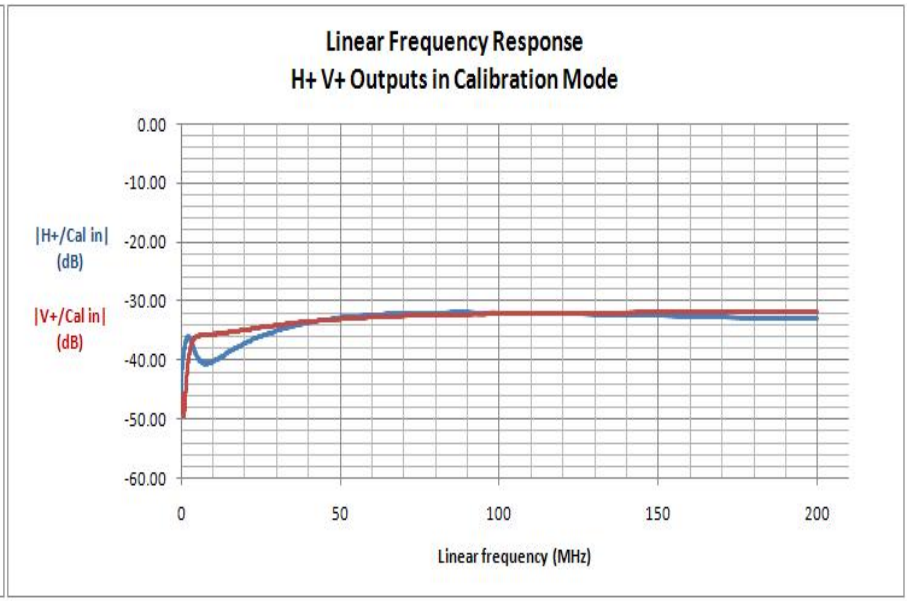




- Good results of Linearity and simmetry for vertical and horizontal planes (wire range position: -9mm to 9mm / 1mm step)
- Measured Sensitivity: $S_V = S_H = 0.043\ (\Delta/\Sigma)mm^{-1}$;
- Ideal Case: $S_{V,H}$ = (Δ=Σ)/Aperture Radio = 1/12mm = $0.083mm^{-1}$

Banwidth

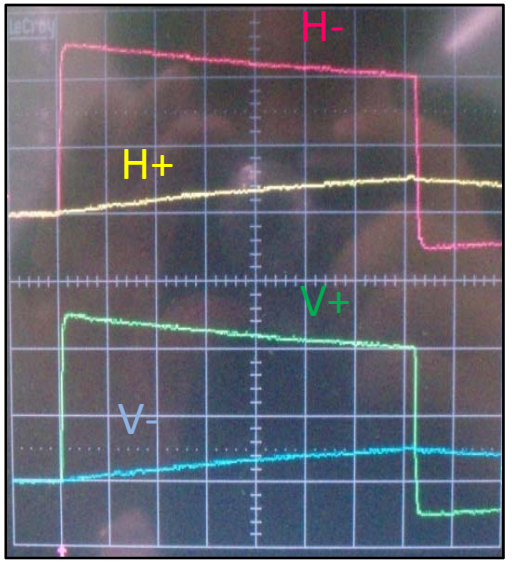




- Bandwidth Specifications: [10KHz-200MHz]
- Good flat response above 30MHz for BPS outputs (V+, V-, H+ and H-)
- Bad response at low frequencies → Improve by reducing toroidal transformers number of turns ($L_{transformer}$ ↓)

Planning

- Re-design and make the new BPS PCBs to improve Sensitivity and BW (reducing the transformers inductance) [At IFIC, 30th May 08]
- Repeat BPS Wire tests [At CERN/BI-Lab, 15th June 08]:
  - Sensitivity and linearity (whole BPS aperture)
  - BPS Bandwidth
  - Determine the pulse droop constant $\tau_{droop,}$ due to BPS electrodes coupling



- Amplifier re-works [At UPC, 30th June 08J :
  - Gain adjust to fit with BPS output levels for ΔH, ΔV and Σ channels
  - τ_{droop} compensation with RC filters
- BPS support construction for TBL installation. [At IFIC, 30th June 08]
- High Frequency setup construction and measurement longitudinal coupling impedance ($Z_{||}$) [At IFIC, September 08]
- Vacuum test of BPS-2 to confirm its leakage rates [At CERN/Vacuum Labs]

Plannig

- Design and construction of precision and automatized Wire Test setup for the BPS Series construction
  [At IFIC, September 08]
- Series Production and Calibration tests
  (a total of 15)
  [At IFIC, October 08]

New Wire Test Setup