

# **BPS for TBL: status of the amplifier**

Gabriel Montoro\*, Antoni Gelonch, Yuri Kubyshin

Universitat Politècnica de Catalunya (UPC)

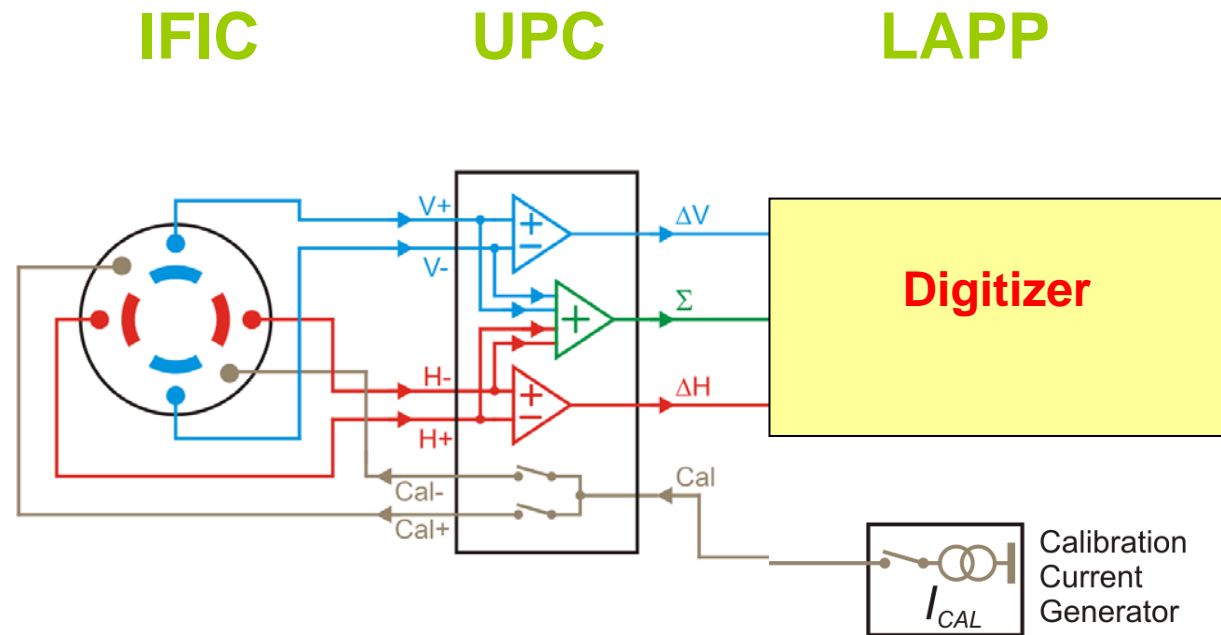
\*E-mail: [montoro@tsc.upc.edu](mailto:montoro@tsc.upc.edu)



<b>Tentative parameters of the BPMs for the TBL</b>	
BPM analog bandwidth (BPM with associated electronics)	<b>10 kHz -100 MHz (200 MHz is highly desirable)</b>
Beam position range of interest	+/-5 mm horizontal and vertical
Beam aperture diameter	22.5 mm
Overall mechanical length	< 100 mm
Beam current	<b>30 A – 1 A</b>
Resolution at maximum current	<5 $\mu\text{m}$
Overall precision	<50 $\mu\text{m}$
Typical radiation levels	<b>&lt;1000 Gray/year</b>

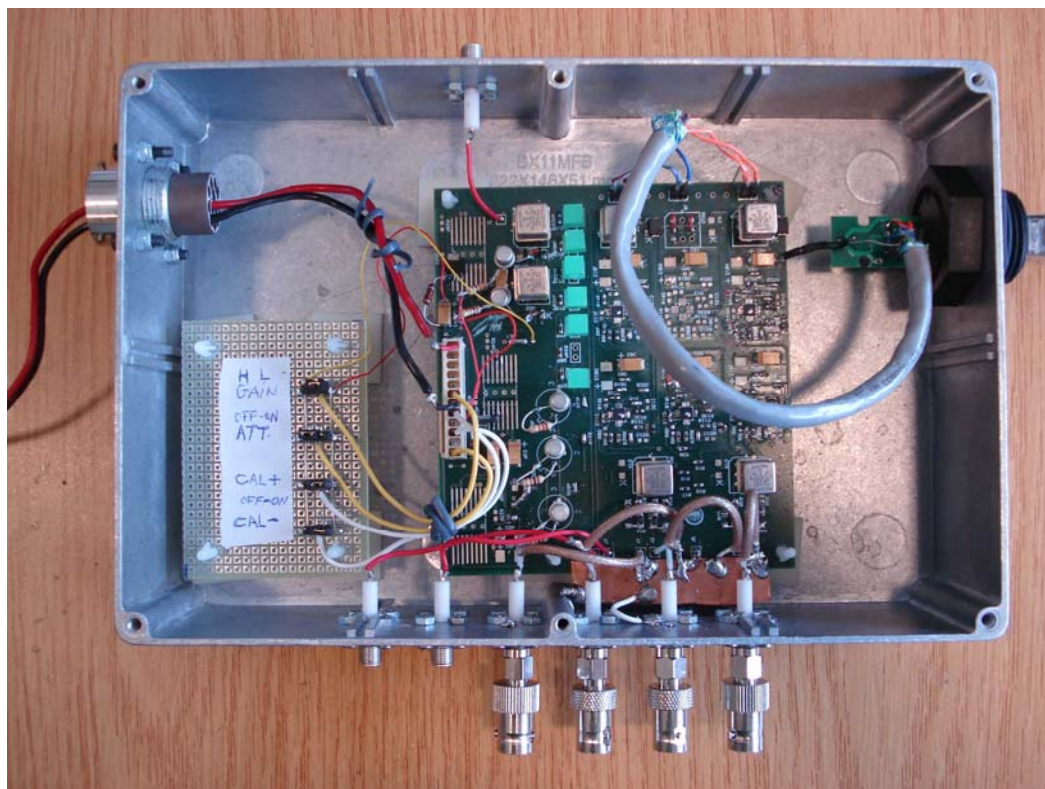


# General scheme of the analog head electronics



Previous design did by M. Gasior

# Completed the first version of the amplifier: now, testing it in the lab. (in UPC and last week in CERN at the Lars Soby lab.)



- It's been necessary to incorporate some **input attenuators** for reducing the high level signals transmitted from the IPU:

At the center position and in a high beam current situation (30 A) each electrode output is around 4 V (50 ohms input impedance)



# Amplifier frequency response (for each electrod channel V+, V-, H+ or H-)



The frequency response is quite good:

- from 4 KHz (limited by a capacitor, easy to modify if it's necessary)
- to 200 MHz (limited by the THS4508 IC response)

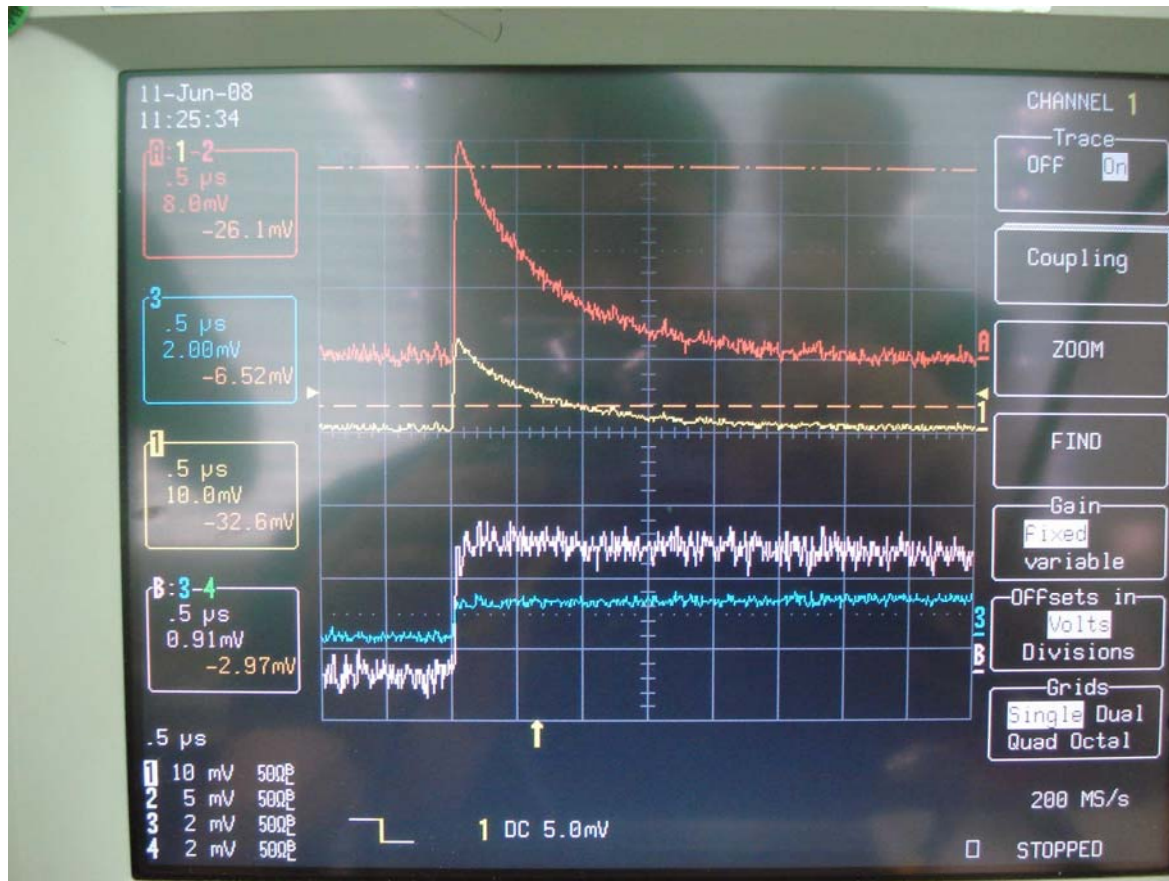
# Amplifier frequency response in common mode



- We must **improve** this response obtained when applying to the Delta channel (vertical or horizontal) the same excitation in each input (in this case the output must be 0)



# IPU+Amplifier: time response when the BPS is excited by a pulse. We did these measurements with a 'wire test setup' in Lars Soby lab. (last week)



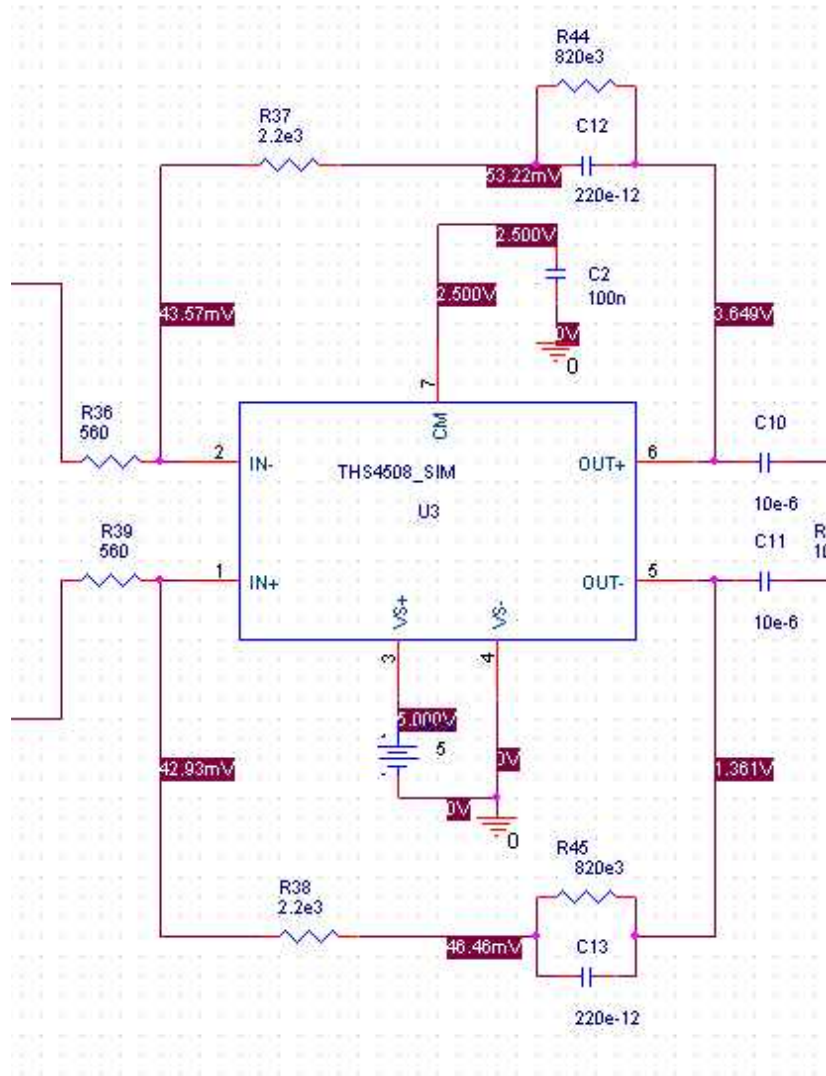
Red plot: Delta signal  
Blue plot: Sigma signal

This 'drop' must be compensated

IPU-Delta low frequency cutoff: **316 KHz**



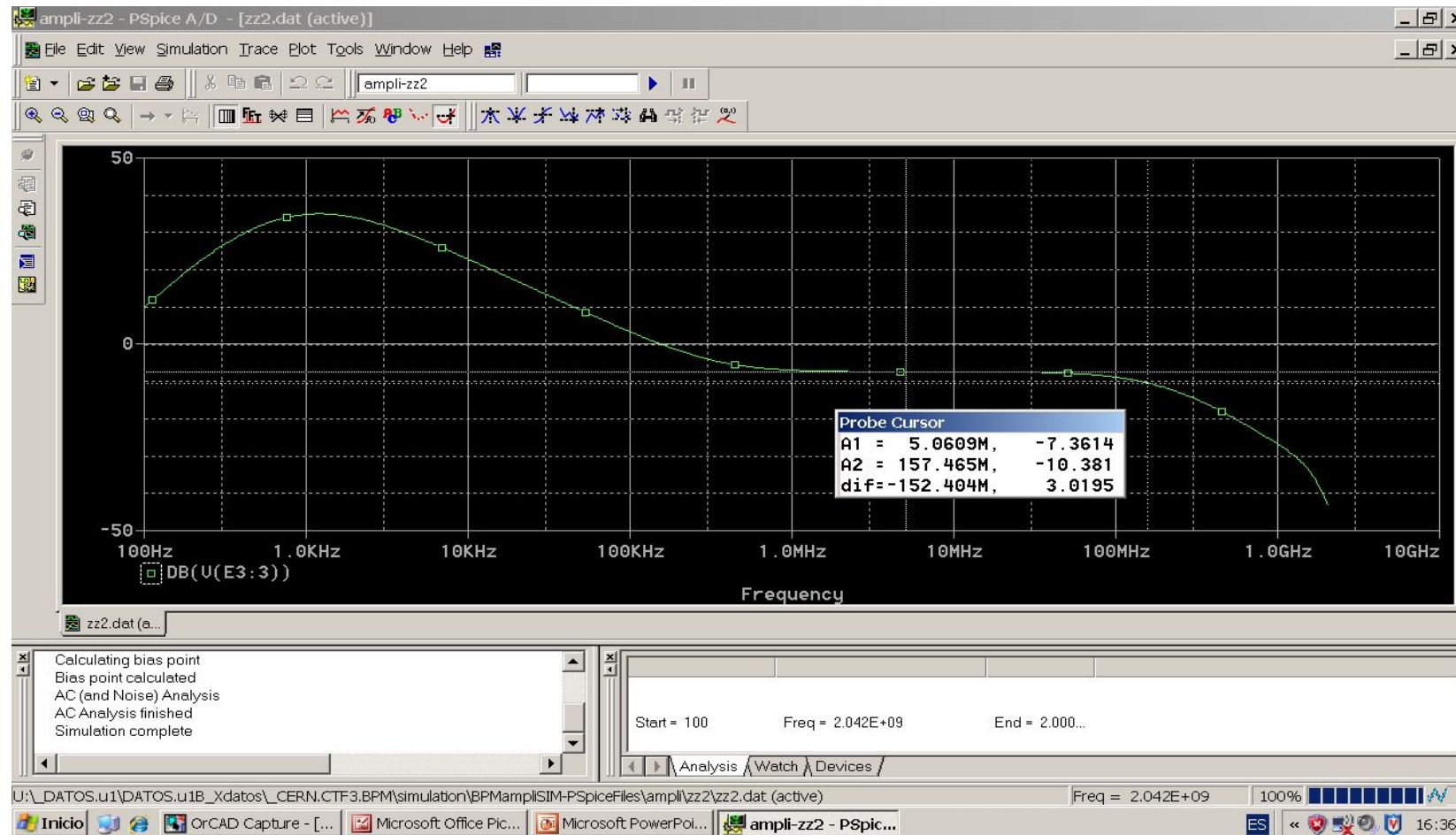
# 'drop' compensation



- R-C network compensation in the feedback path



# PSpice frequency response of the compensated amplifier channel. A problem: the amplifier high frequency cutoff is reduced !!!



## Next work to do ...

1. ... to finish the 'drop compensation' solving the high frequency reduction problem
2. ... to test the BPS+amplifier with the 'drop' compensation: on July
3. ... to incorporate 'all the accumulated' rework and improvement in a second PCB board



# That's all. Thanks.

Gabriel Montoro  
montoro@tsc.upc.edu

