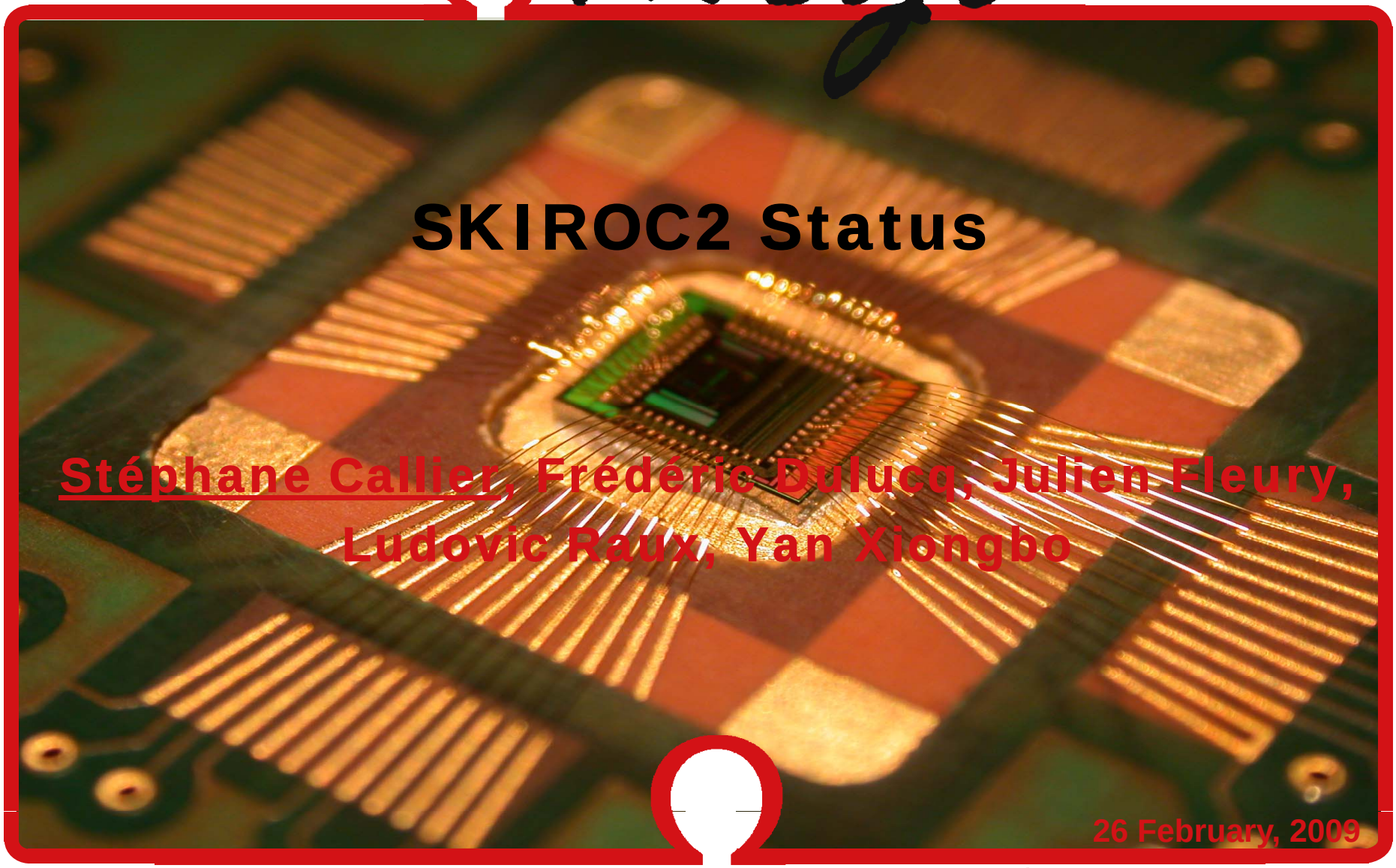
IN2P3 CSNSM LAL LPNHE IPN Orsay

Omega



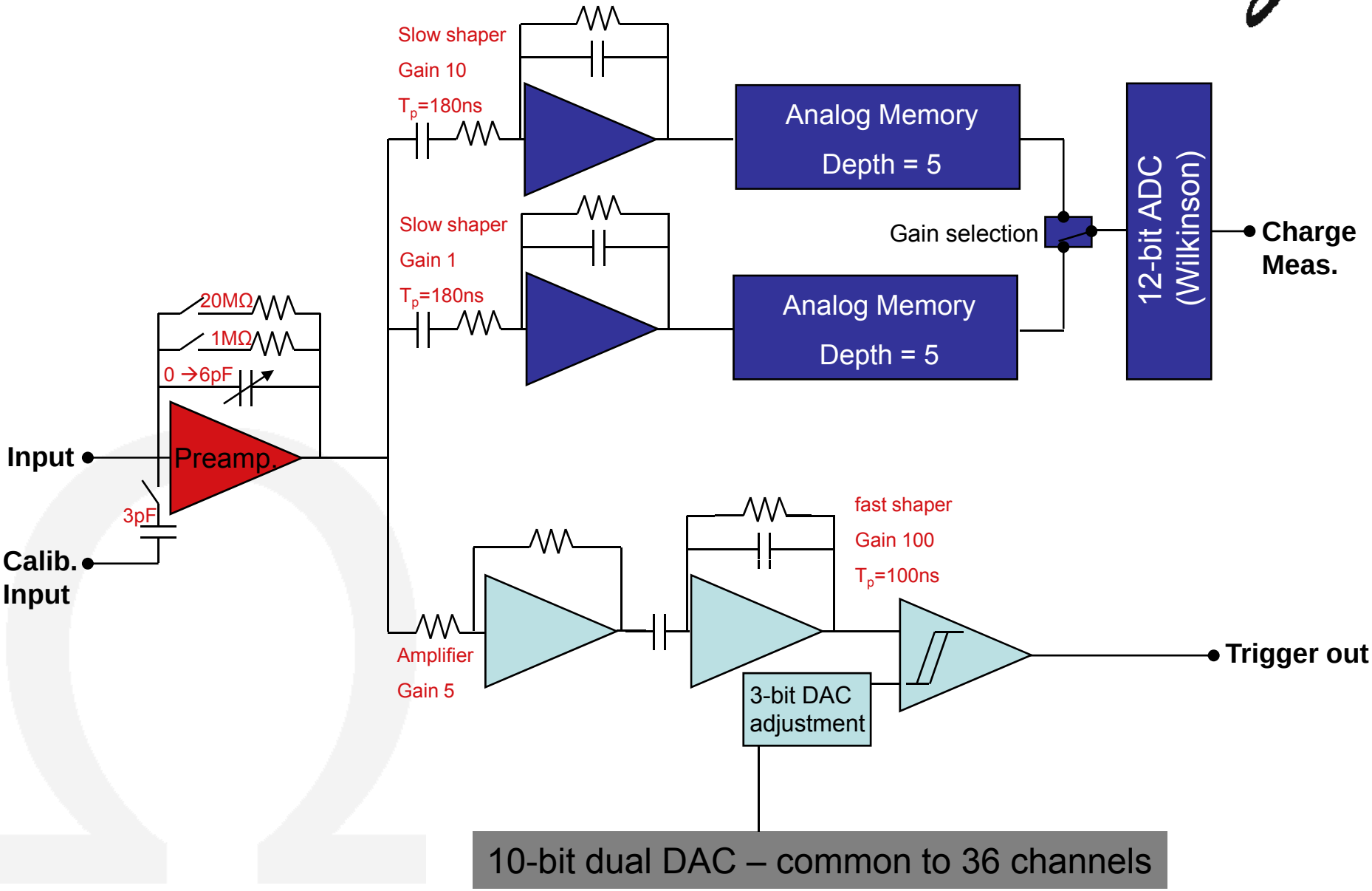
SKIROC2 Status

Stéphane Callier, Frédéric Dulucq, Julien Fleury, Ludovic Raux, Yan Xiongbo

26 February, 2009

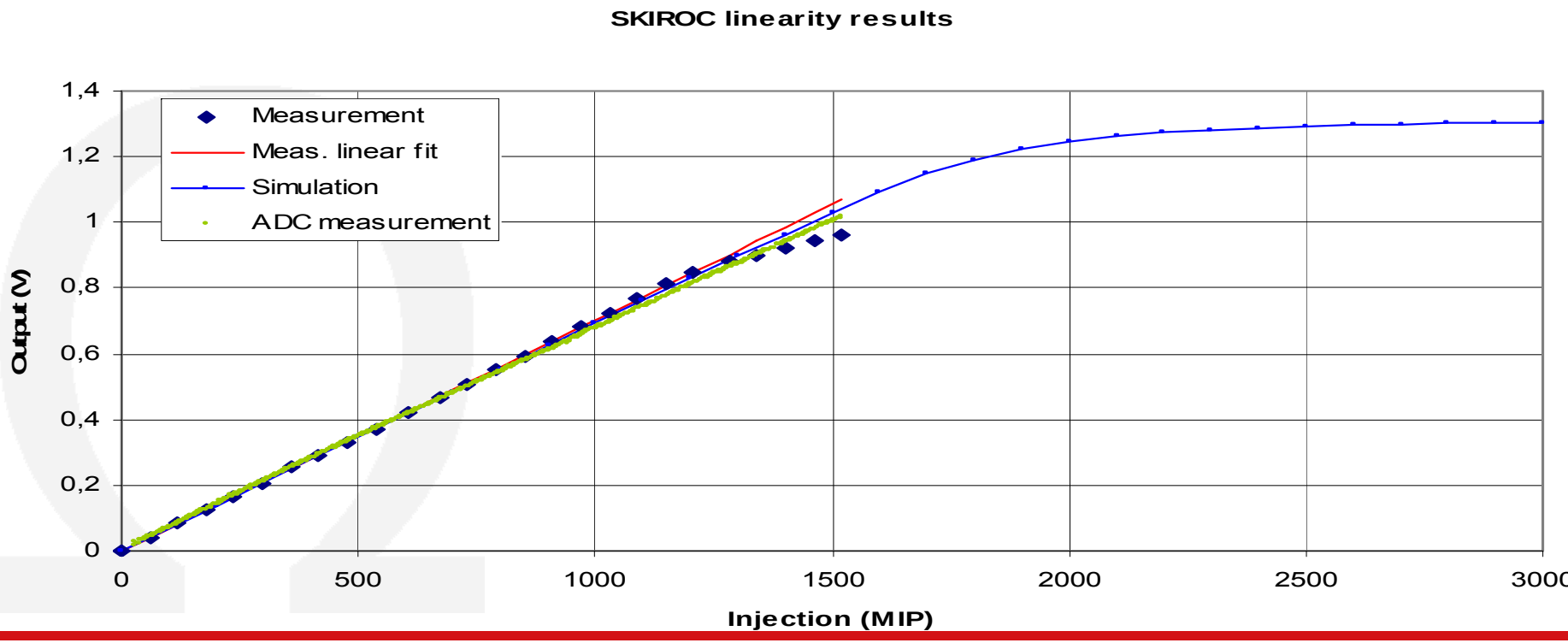
Orsay MicroElectronics Group Associated

SKIROC1 One channel block scheme

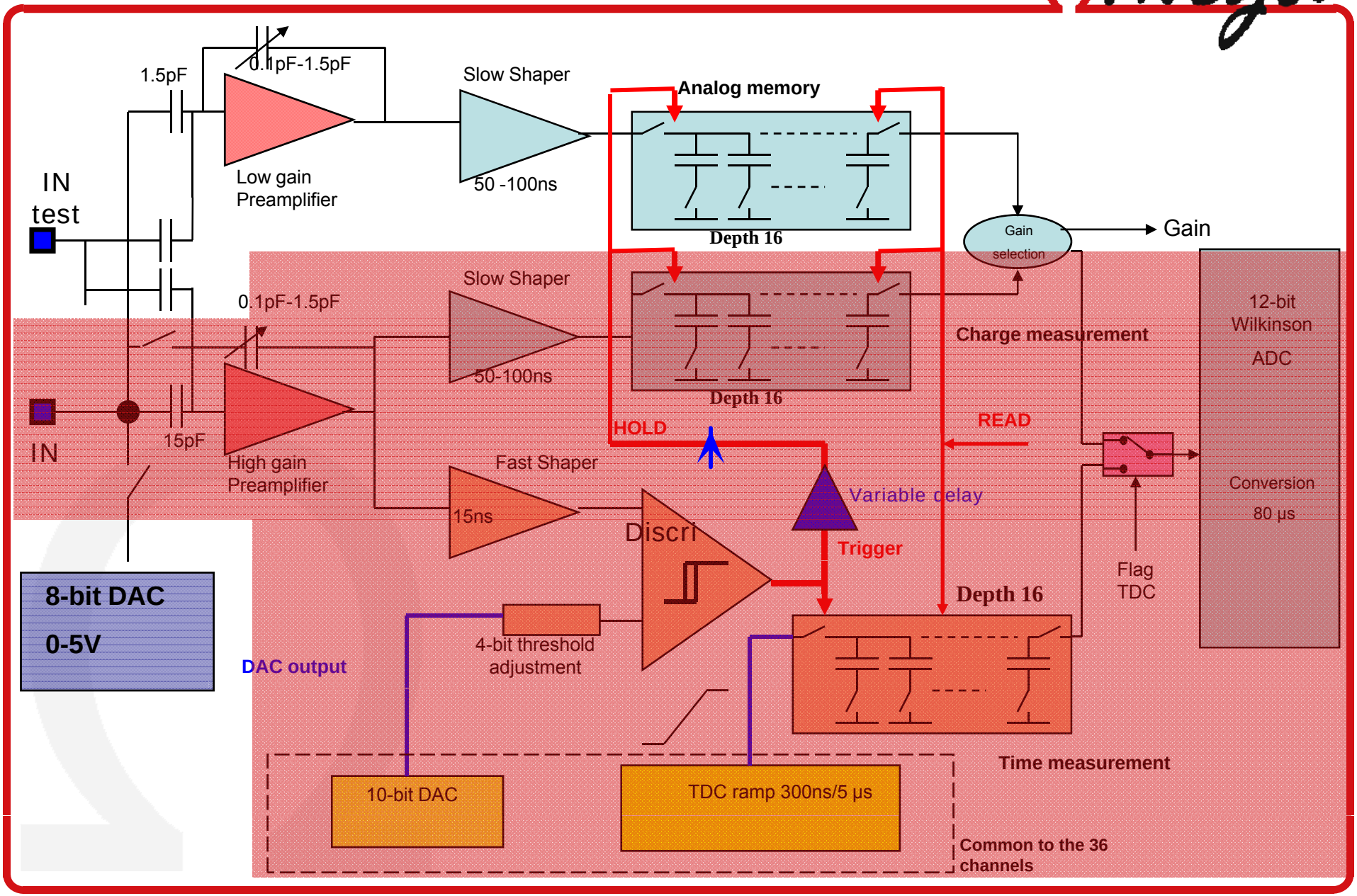


SKIROC 1 design limits

- Most critical issue : Dynamic range of the charge preamplifier
  - Max input signal : 2000 MIP
  - Noise floor : 0.15 MIP
- Preamplifier gain too small
- Huge gain in the trigger path to be able to trig on ½ MIP

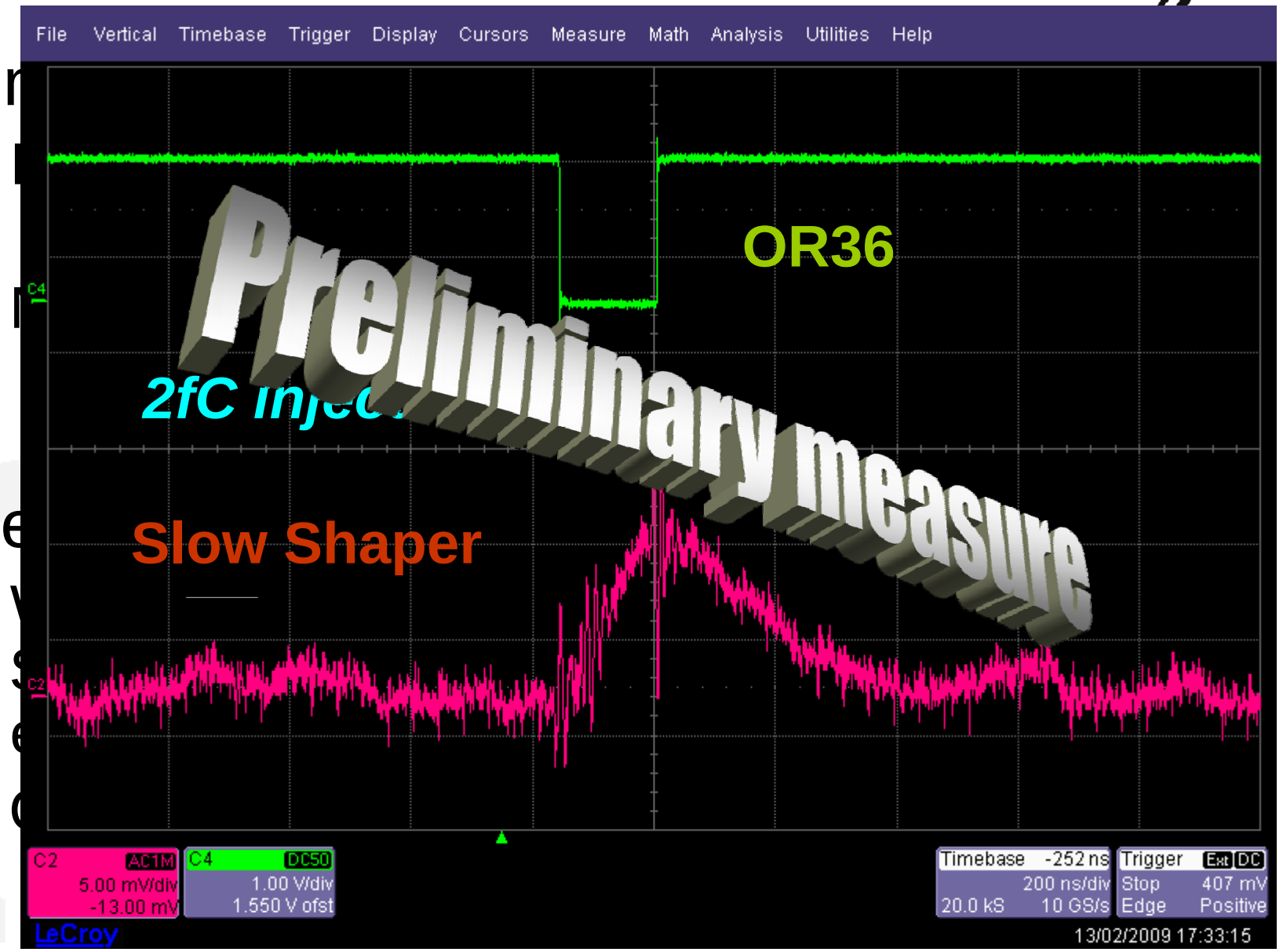


SPIROC used in SKIROC mode

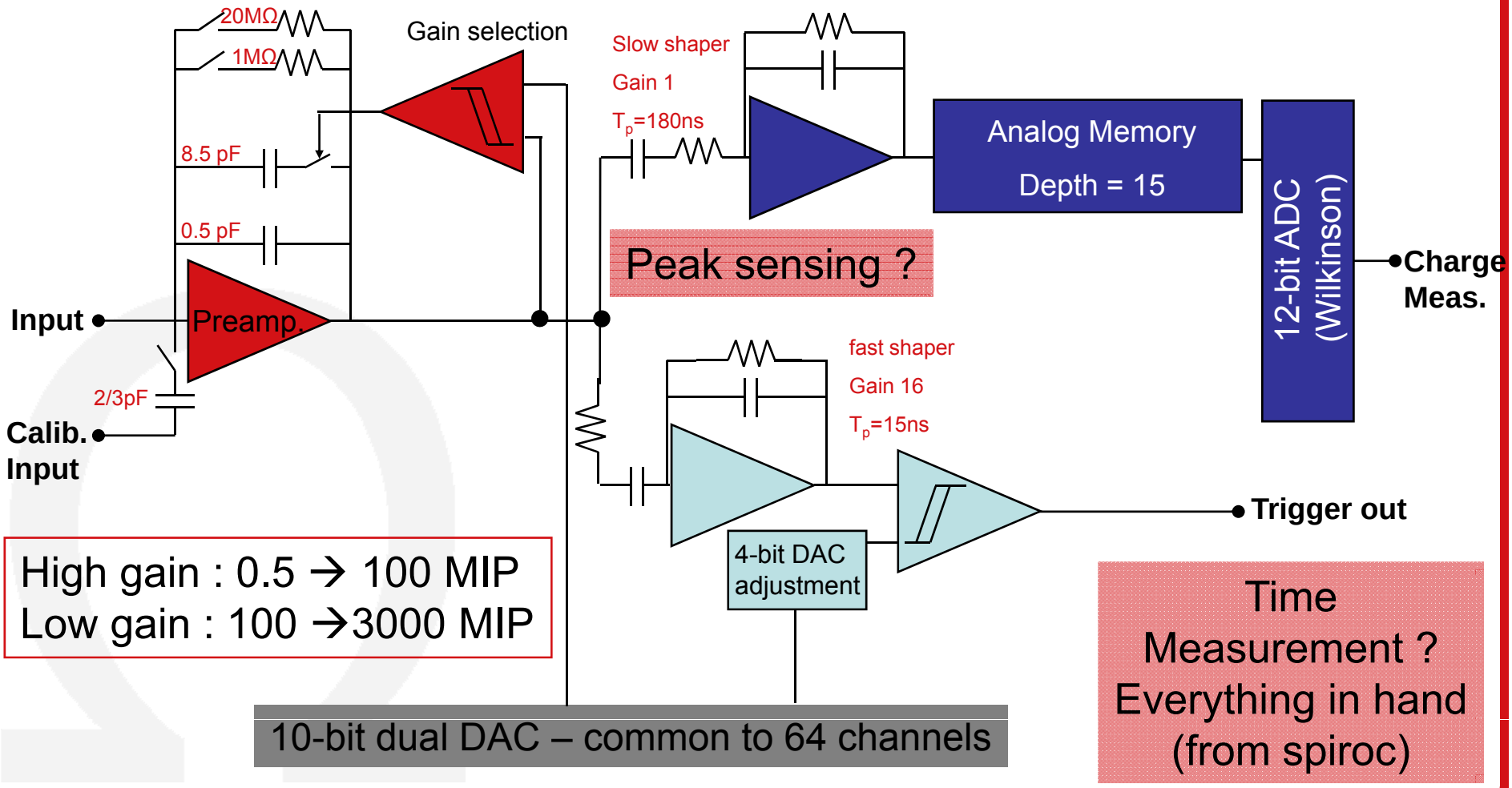


SPIROC in ECAL

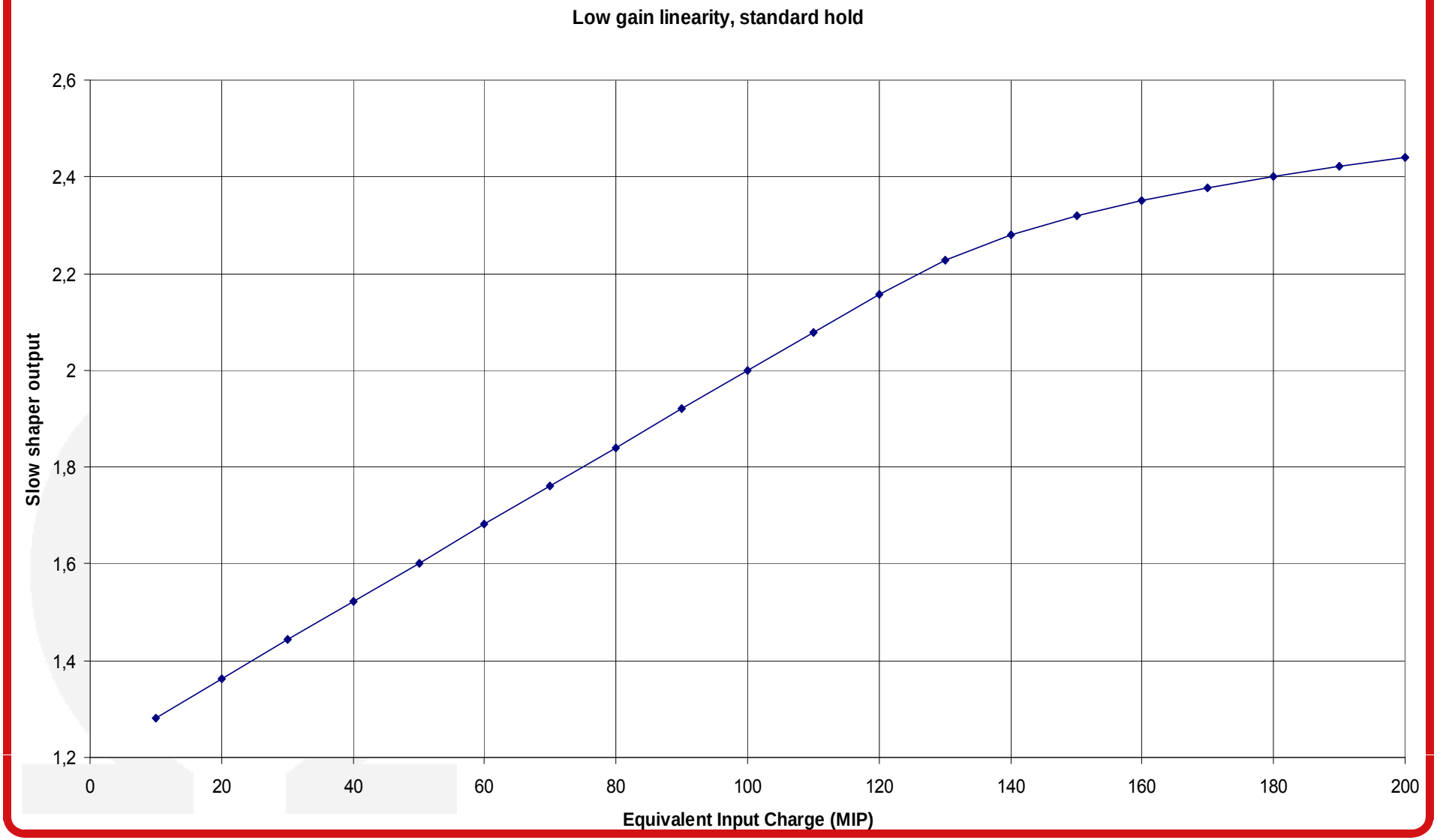
- Lin
  - –
  - –
- Me
  - –
  - –



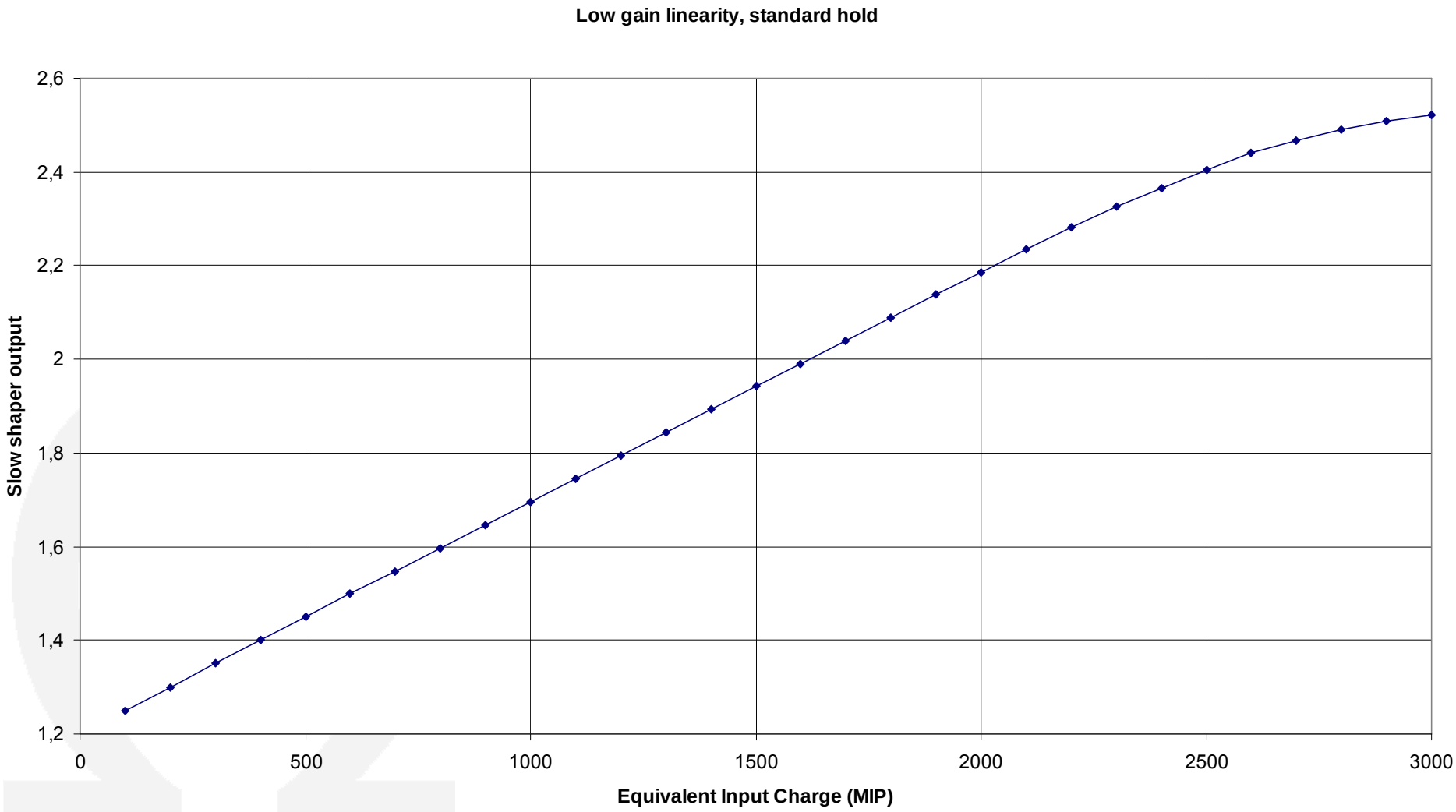
SKIROC 2 block scheme proposal



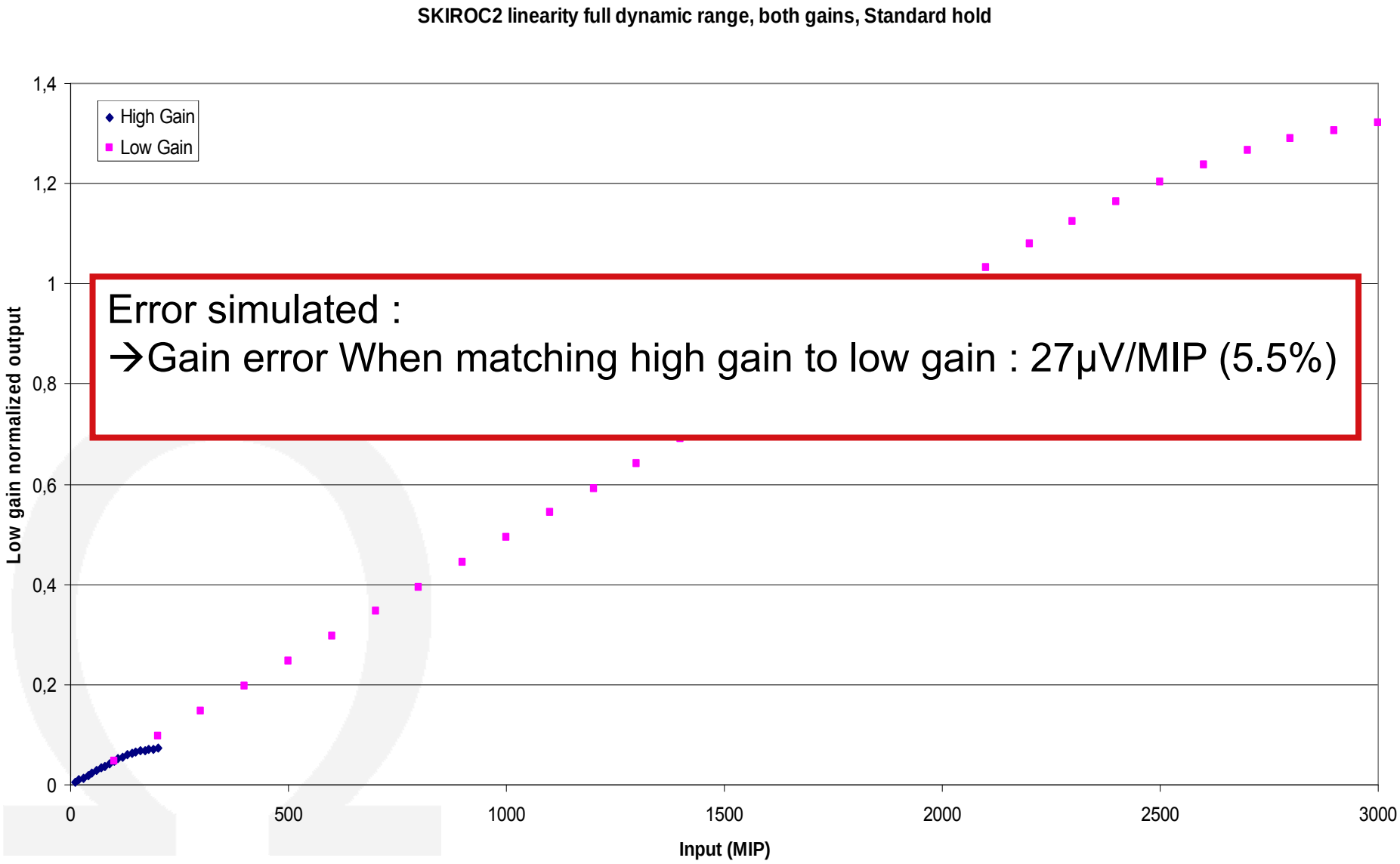
One channel simu. → High Gain



One channel simu. → Low Gain

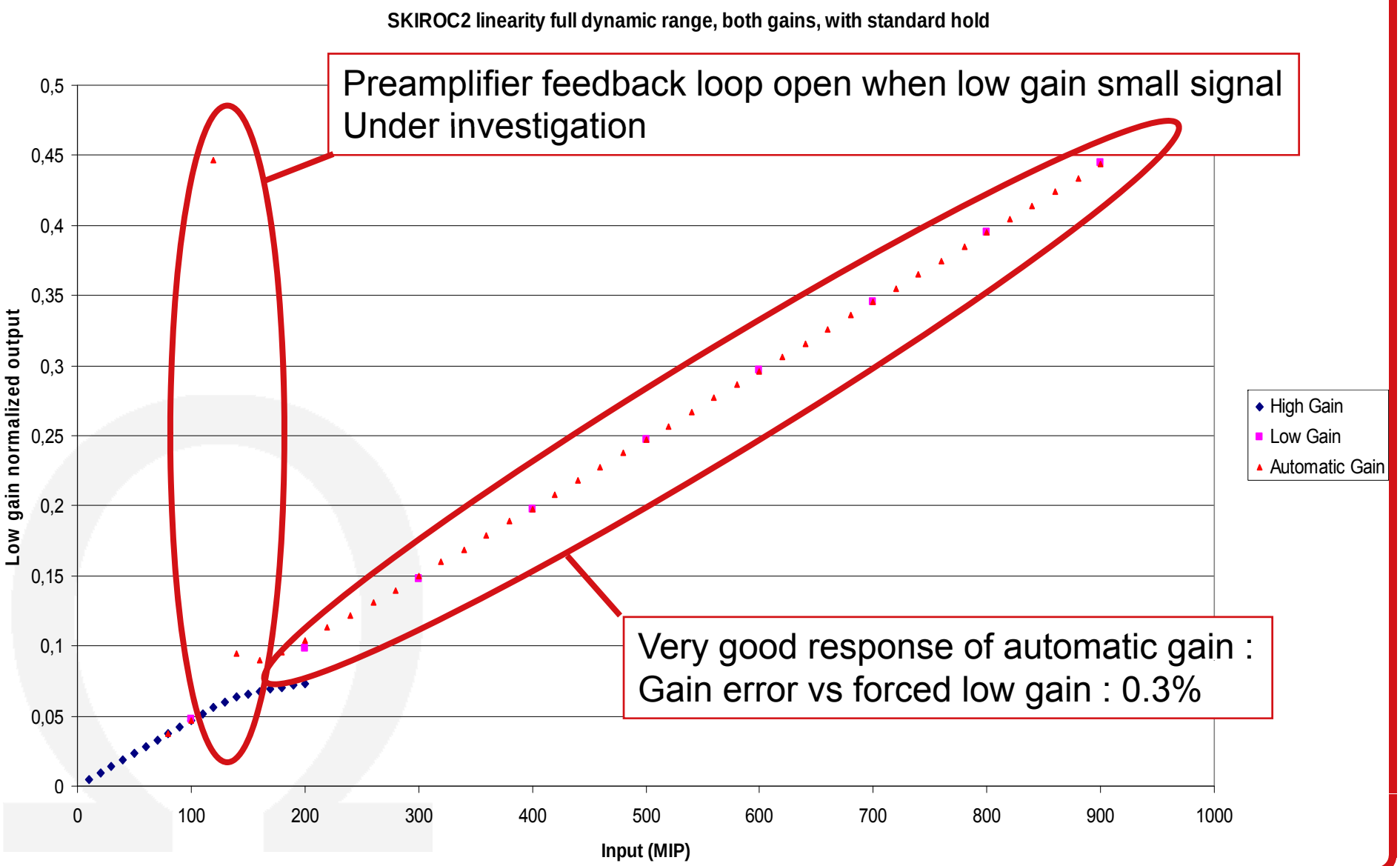


One channel simu → Gain matching



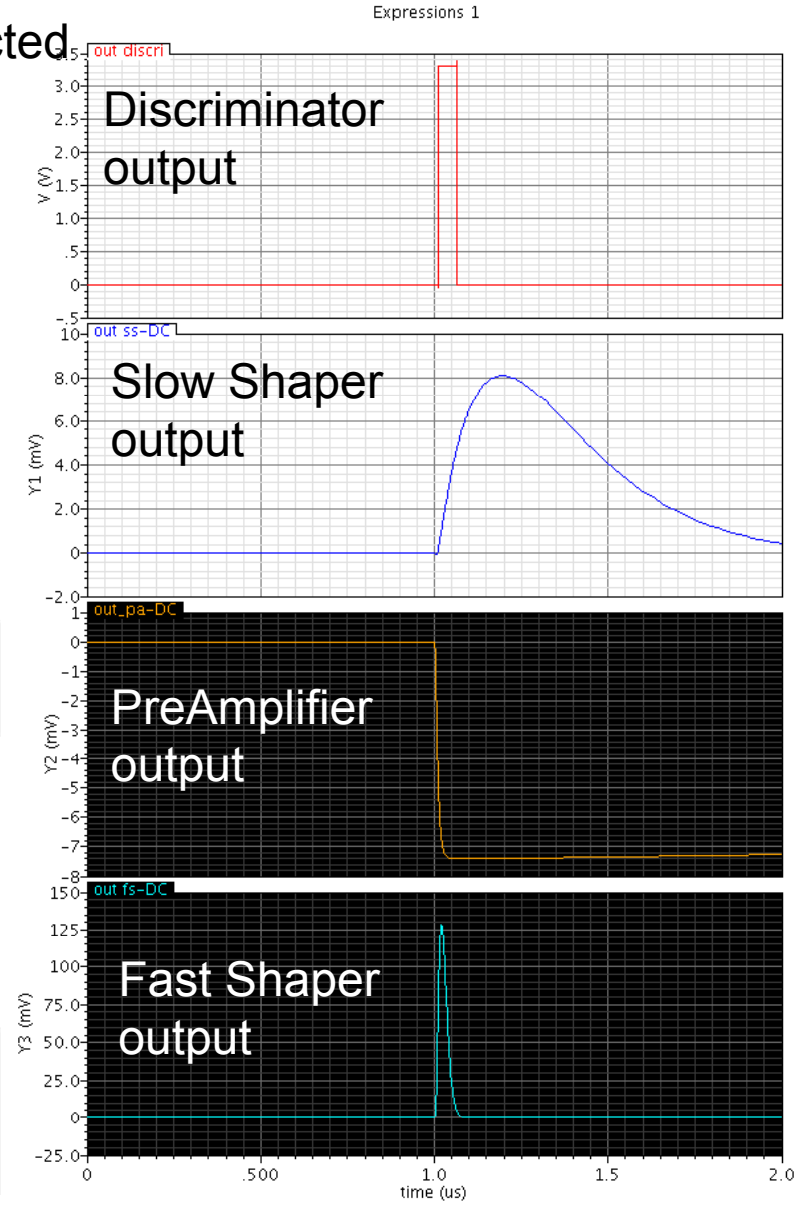
Error simulated :
→Gain error When matching high gain to low gain : 27µV/MIP (5.5%)

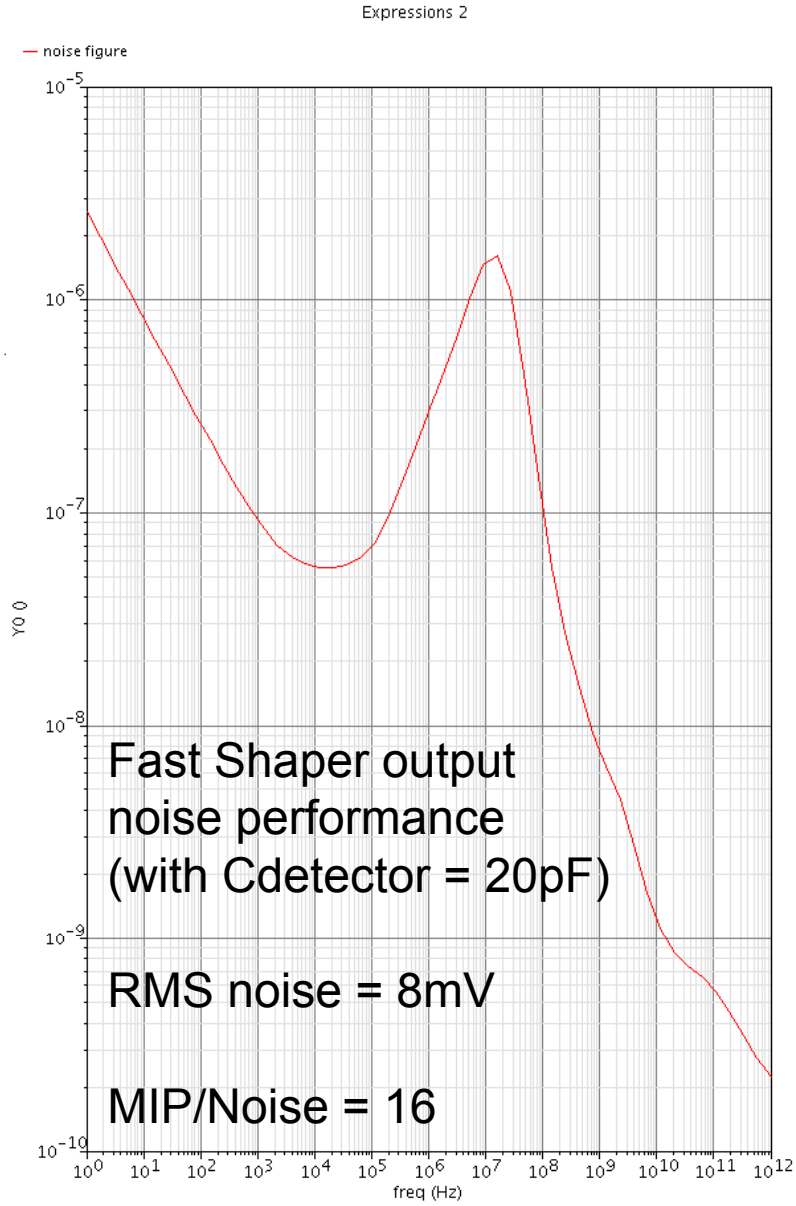
One channel simu. → Automatic Gain



SKIROC2 Analogue Simulation

Q injected
1 MIP

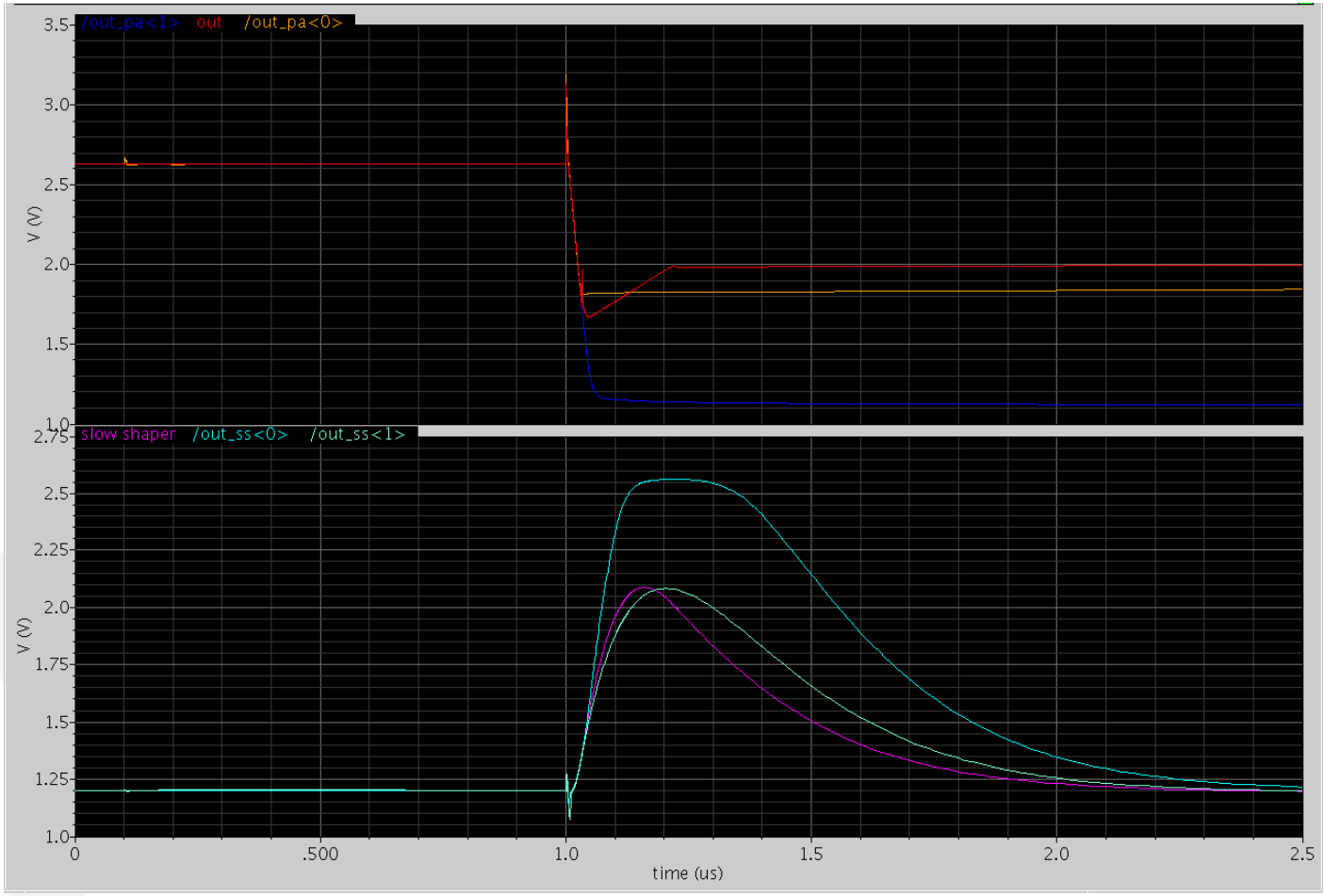




Conclusion

- Skiroc 2 to be sent in fab in june 2009
  - Still in design and simulation phase
    - Digital simulation and layout : OK
  - If SKIROC 2 is validated → production in hand for EUDET module
  - Else SPIROC2 will be used in SKIROC mode
  - Sharing of the HARDROC2 and SPIROC2 production
  - Cheaper than an engineering run for prototyping due to large silicon area (60mm² ie ~60k€)

Backup slide : Dynamic gain preamp



Injection : 1000MIP, Low gain, High Gain (saturated), auto Gain Preamp & slow shaper (preliminary simulation)