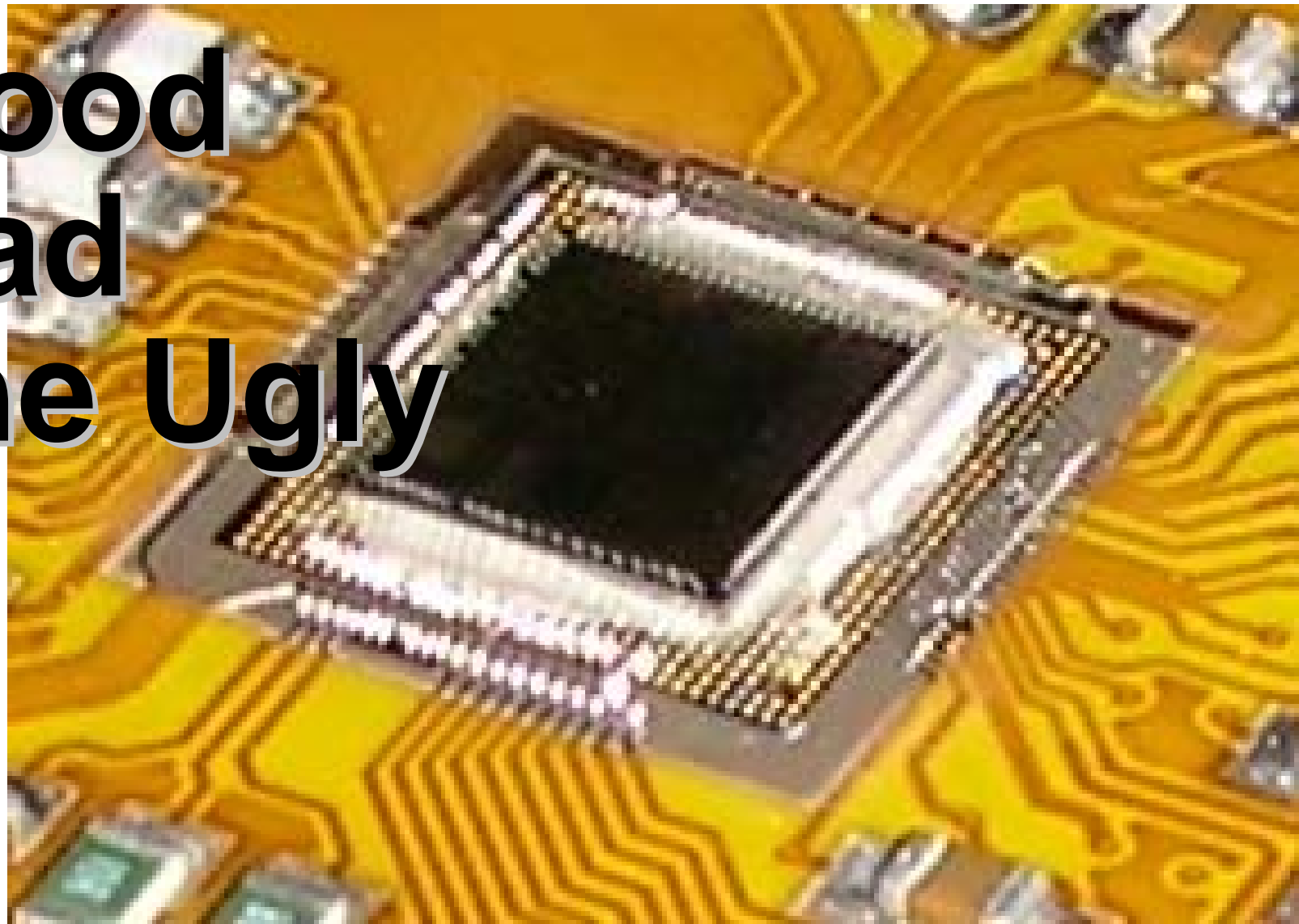


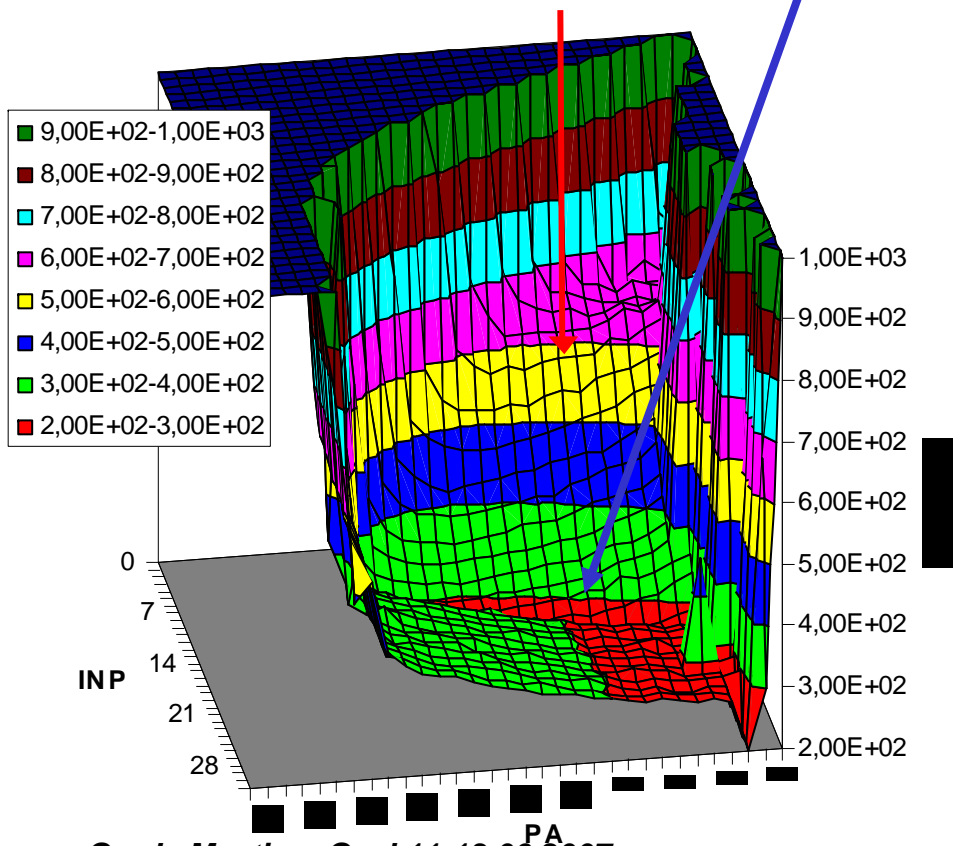
The Good The Bad And the Ugly

Ulrich Trunk

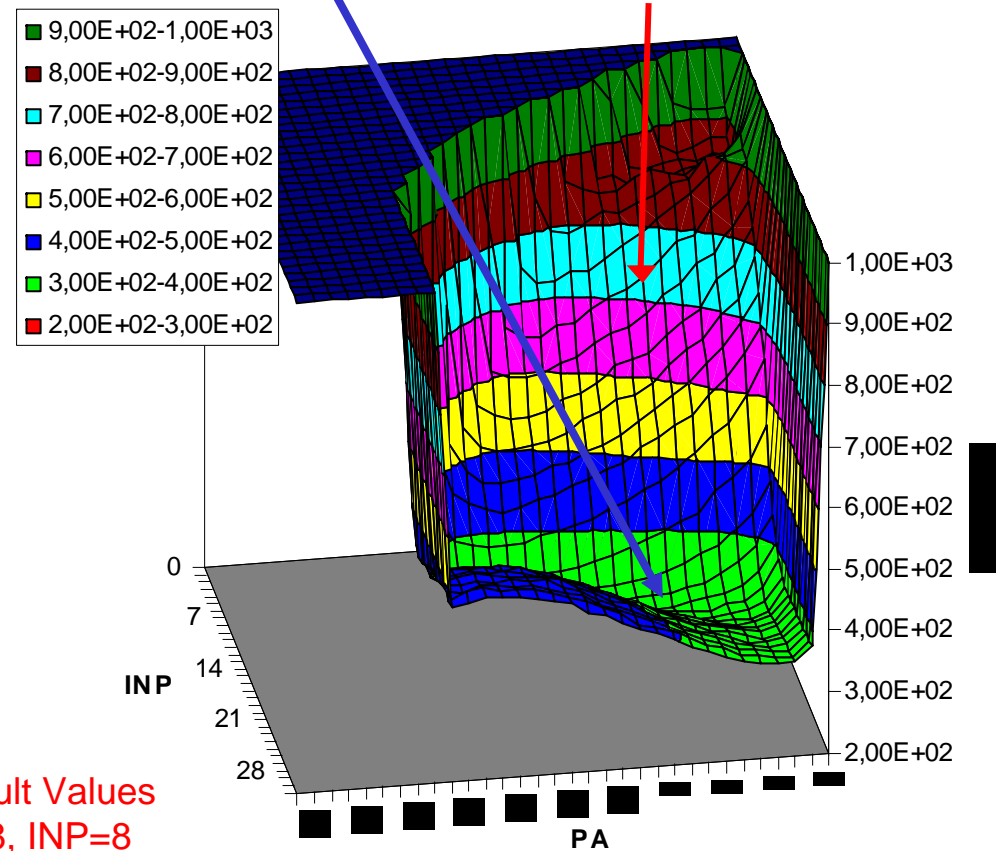


Results from noise measurements:
ENC=300..310e (2.1keV) @ 33pF, 300K
ENC=270..280e (1.9keV) @ 33pF, 77K
 for a single channel (PA~8, INP~18)

MEAN RAW ENC (33pF@77K)

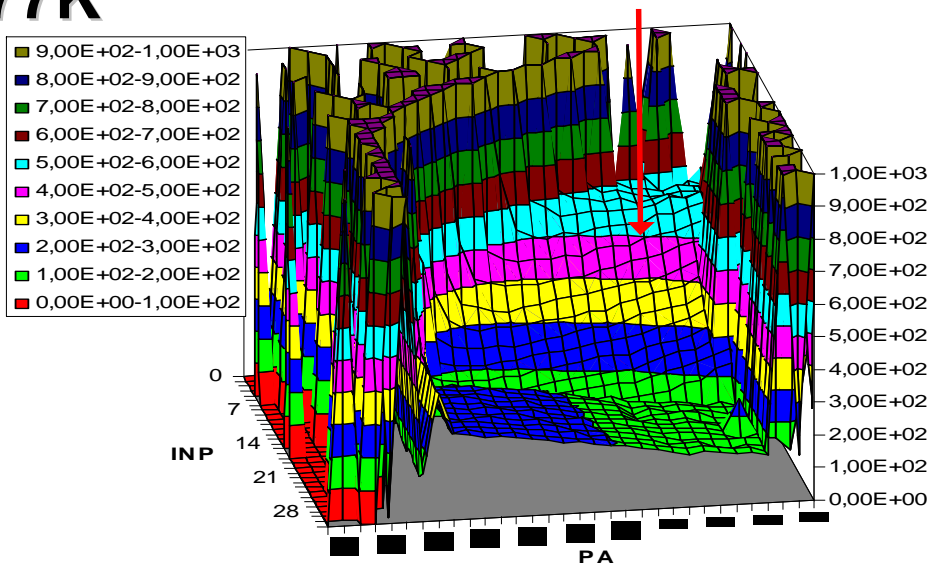


MEAN RAW ENC (33pF@300K)

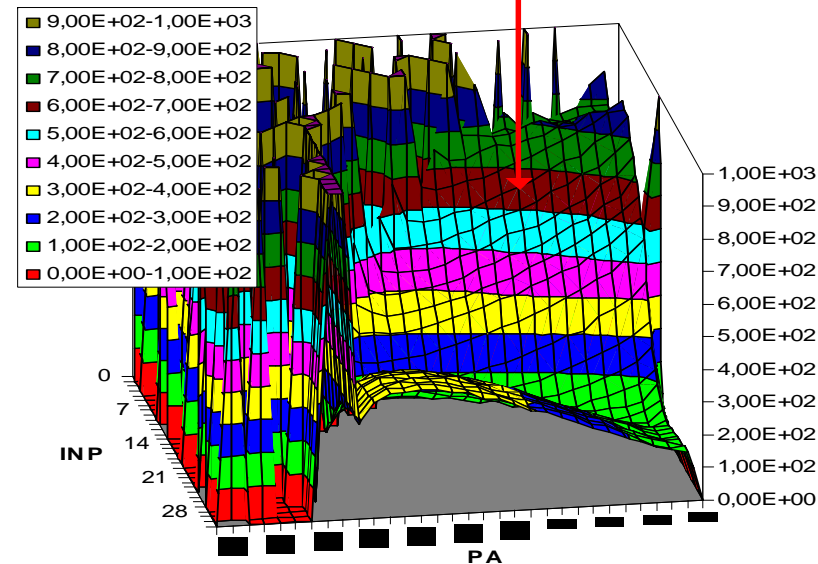


120..140e @ 300K
100-120e @ 77K

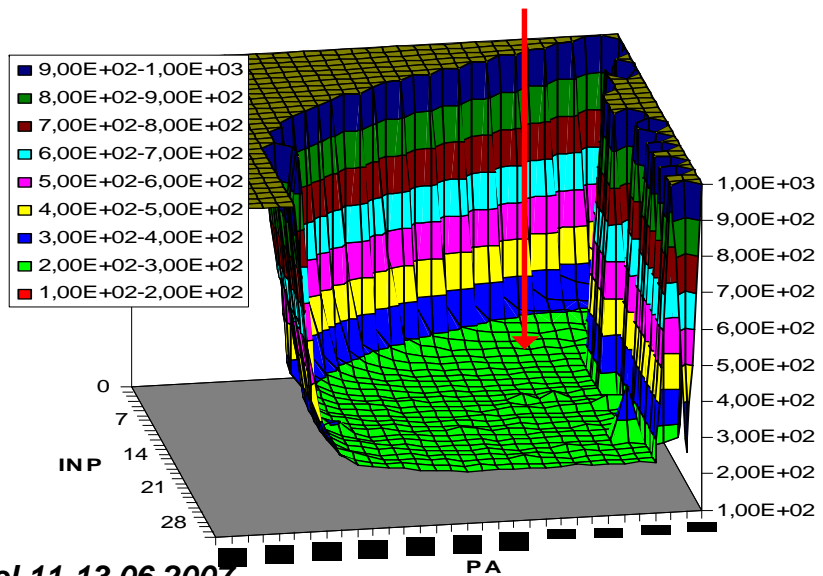
Common Mode (33pF @77K)



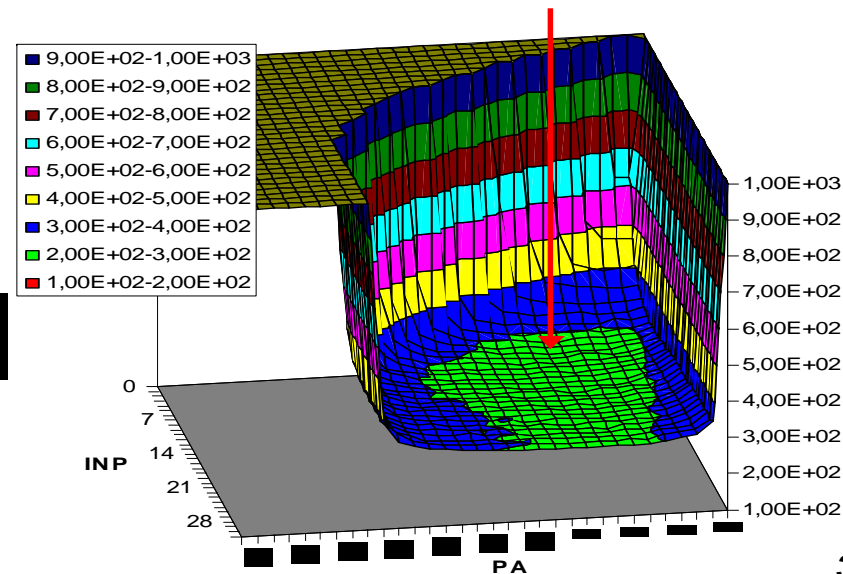
Common Mode (33pF @300K)



"Differential" ENC(CH3-CH4) (33pF @77K)



"Differential" ENC(CH3-CH4) (33pF @300K)



Default Values
PA=8, INP=8

In the Bias Circuit:

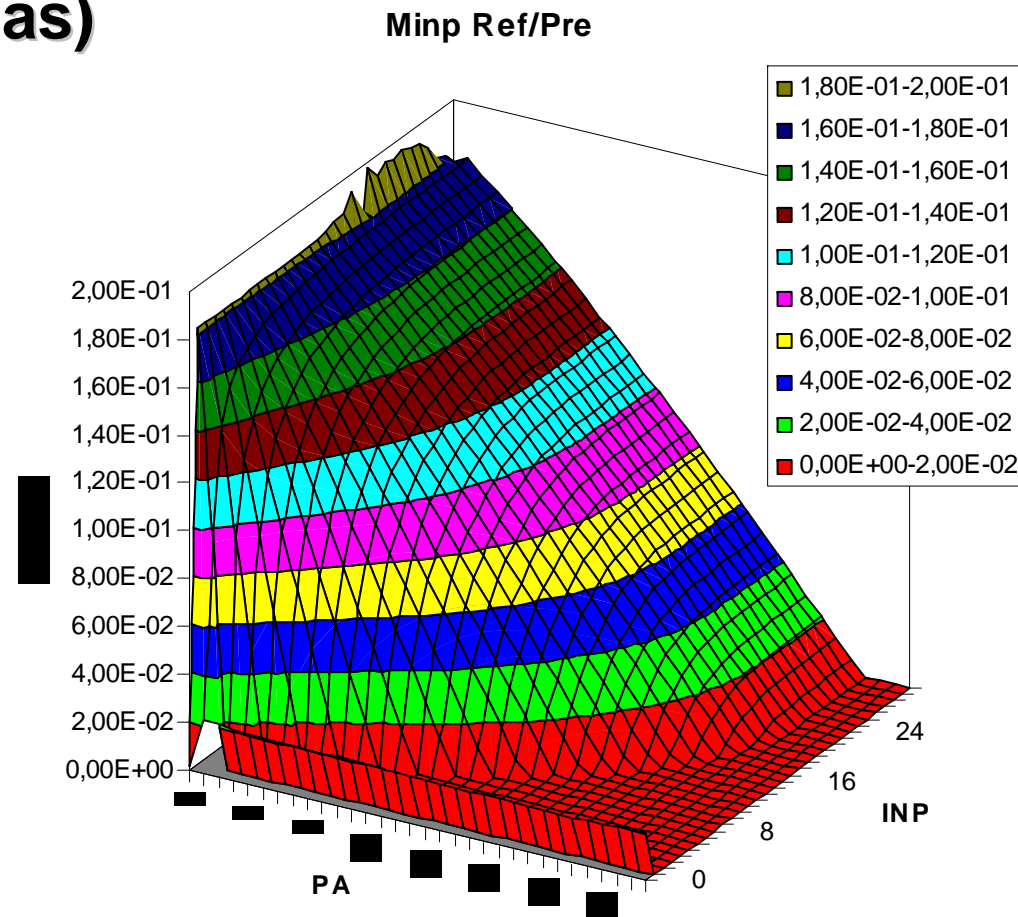
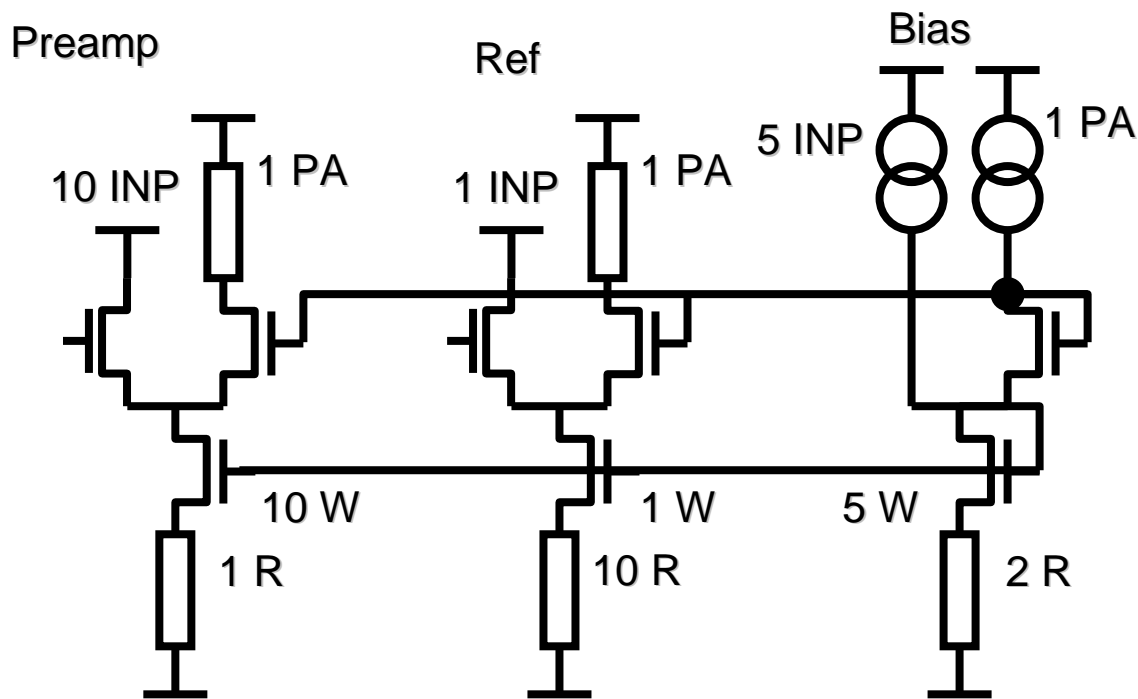
Common source degeneration resistor for Preamp and Preamp_Ref

Design current ratios:

✂ Active Branch: 10(Preamp) 1(Ref) 5(Bias)

✂ Load Branch: 1(Preamp) 1(Ref) 1(Bias)

✂ will change if Bias is changed!



✂ **F-CSA104 noise can be reduced to**

RAW ENC=184e+2.85e/pF

ENC = 148e+2.84e/pF

CM = 110e+0.33e/pF

@77K (preliminary results)

I.E. +1.9keV @ 33pF by tuning the bias

✂ **The common mode remains a sizable contributor to this number**

✂ **A design flaw in the bias circuit was found, which causes offset variations and might also be the reason for reduced PSRR**

Next steps:

✂ **Test of the chip with a crystal**

✂ **Probably a redesign of the bias circuit**