



CCLRC
Rutherford Appleton Laboratory

CALICE front-end update

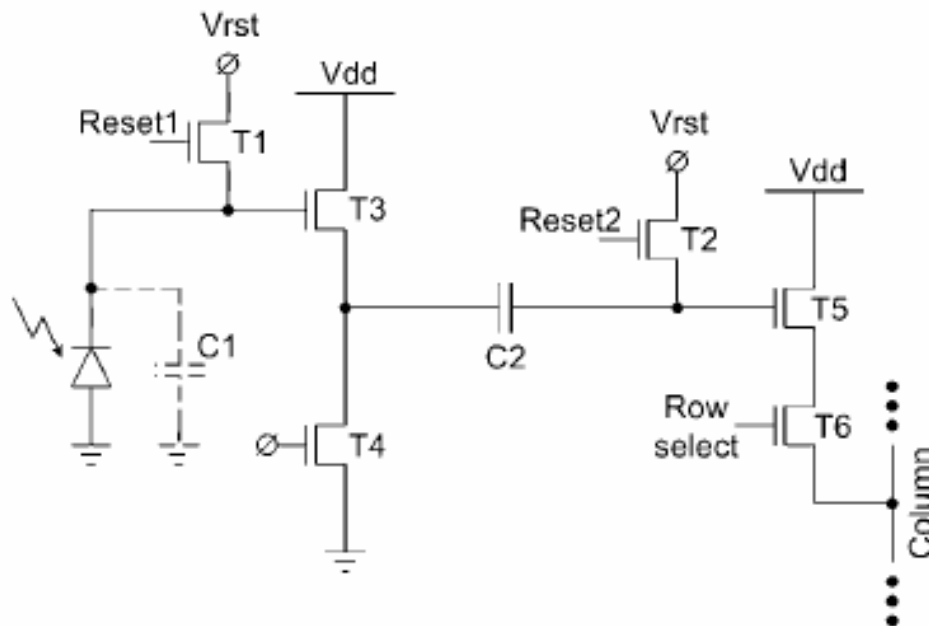
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CCLRC Technology

In pixel CDS.

Starting point

Proposed by Kleinfelder et al.



It does an in-pixel CDS

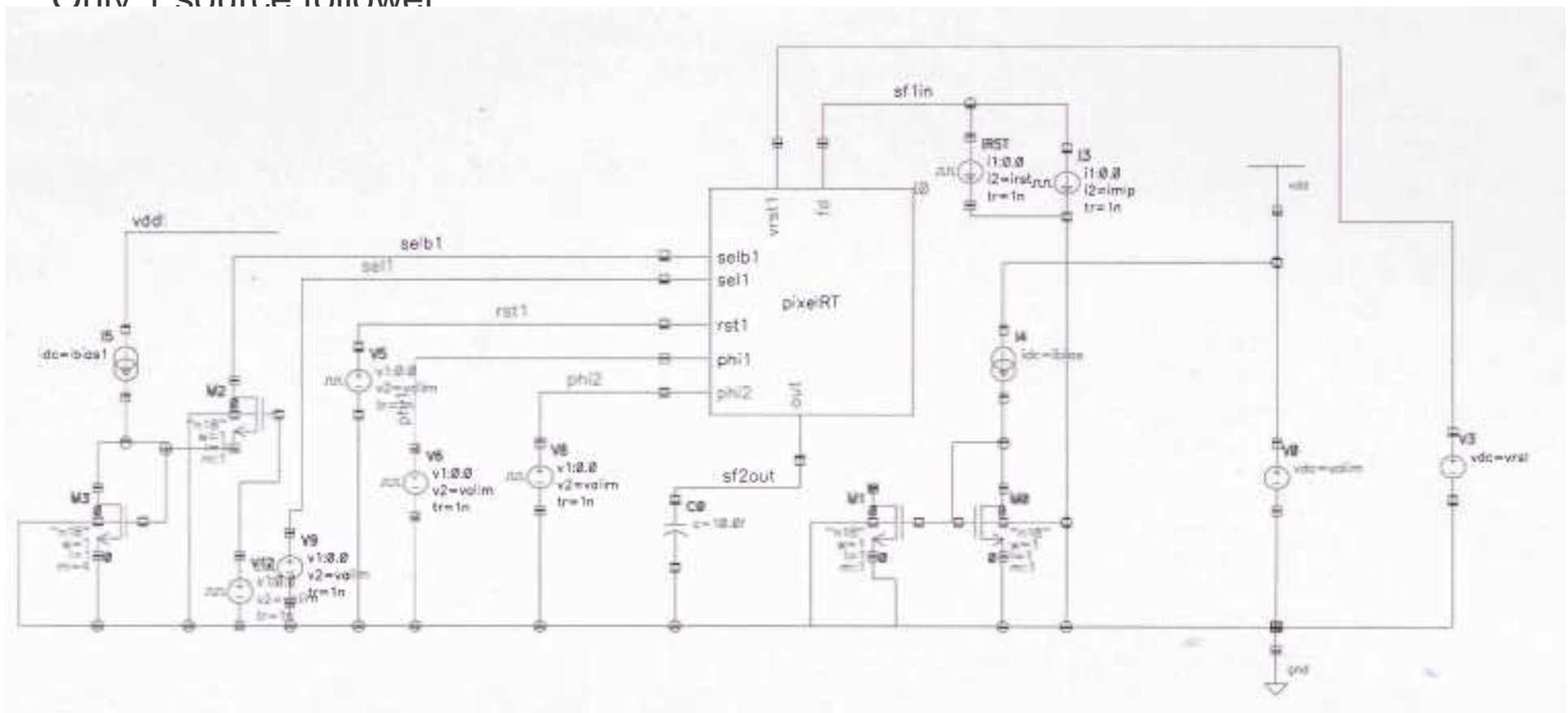
Hence, the noise improvement is

$$\frac{V_n}{V_{n,CDS}} = \sqrt{\frac{C_2}{C_1}} \cdot A_{SP1} \quad (7)$$

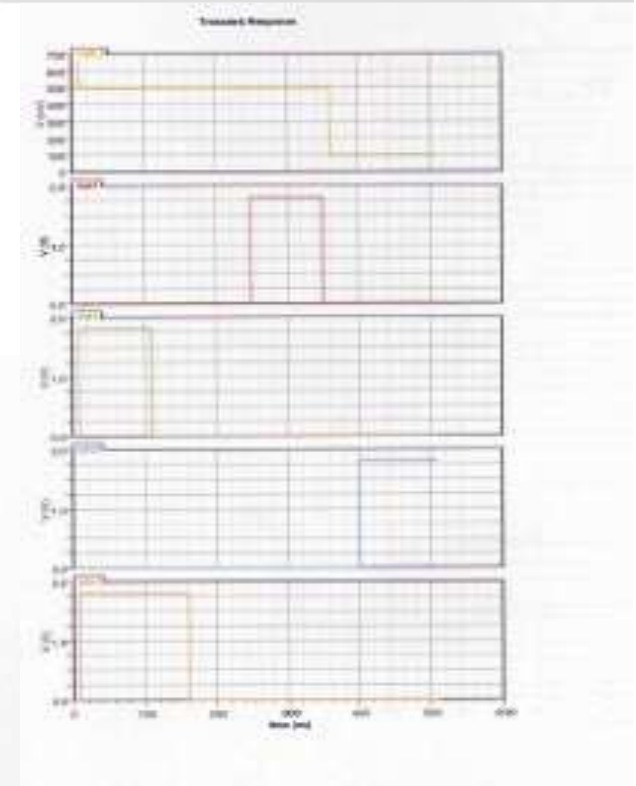
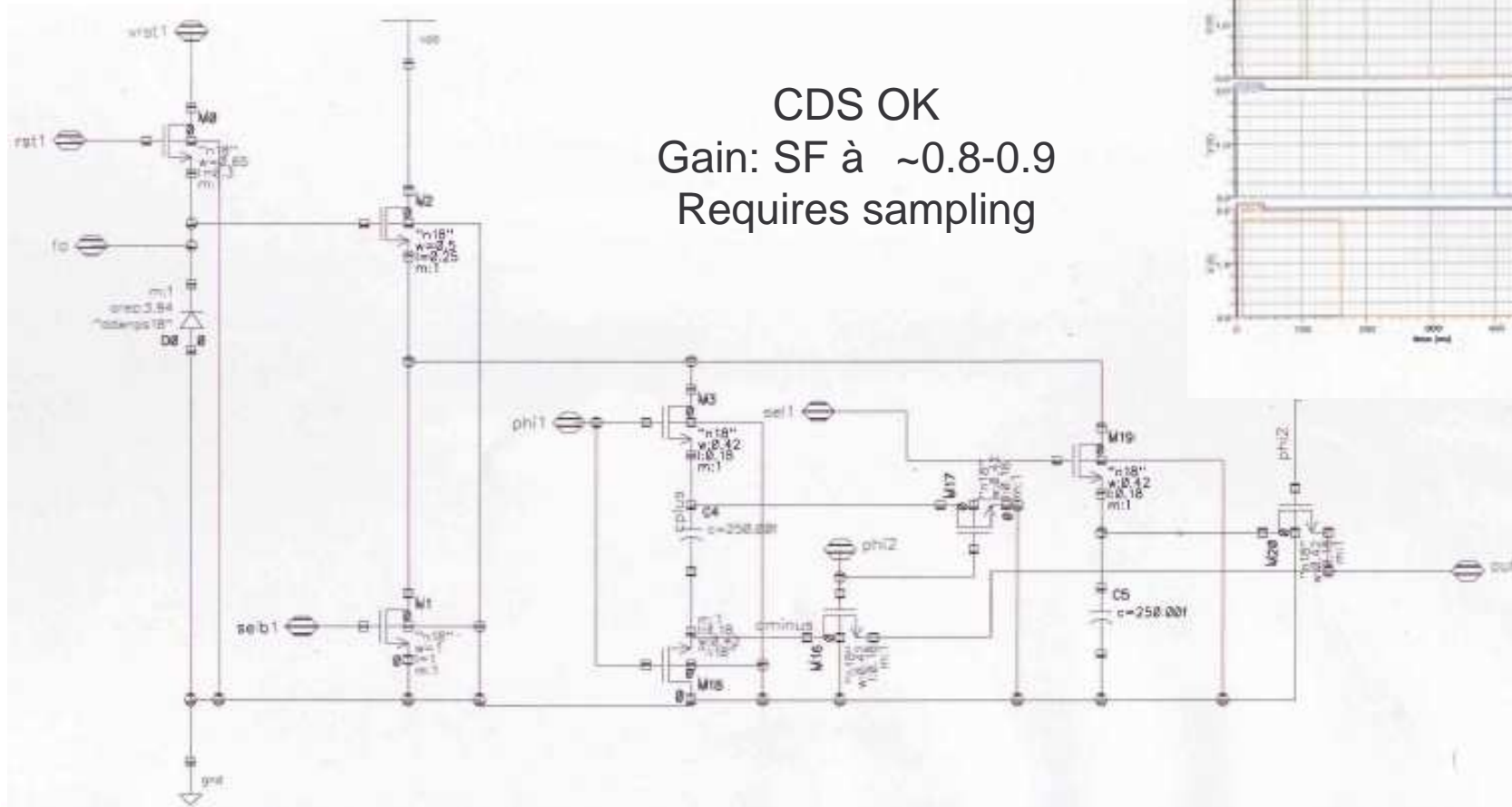
Fig. 11. Basic kT/C noise-reduction pixel schematic.

In pixel CDS. Switched capacitor version

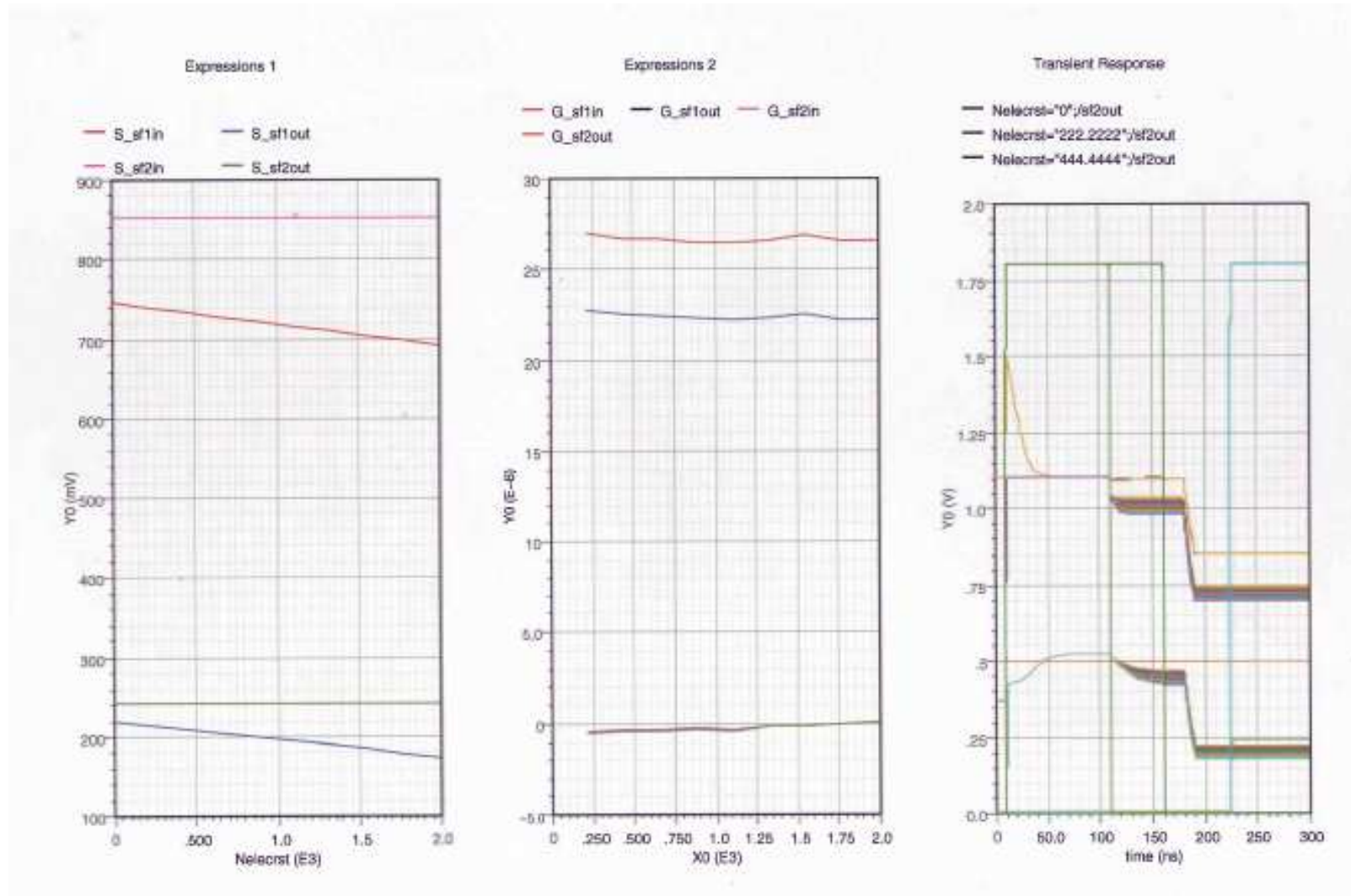
Only 1 source follower



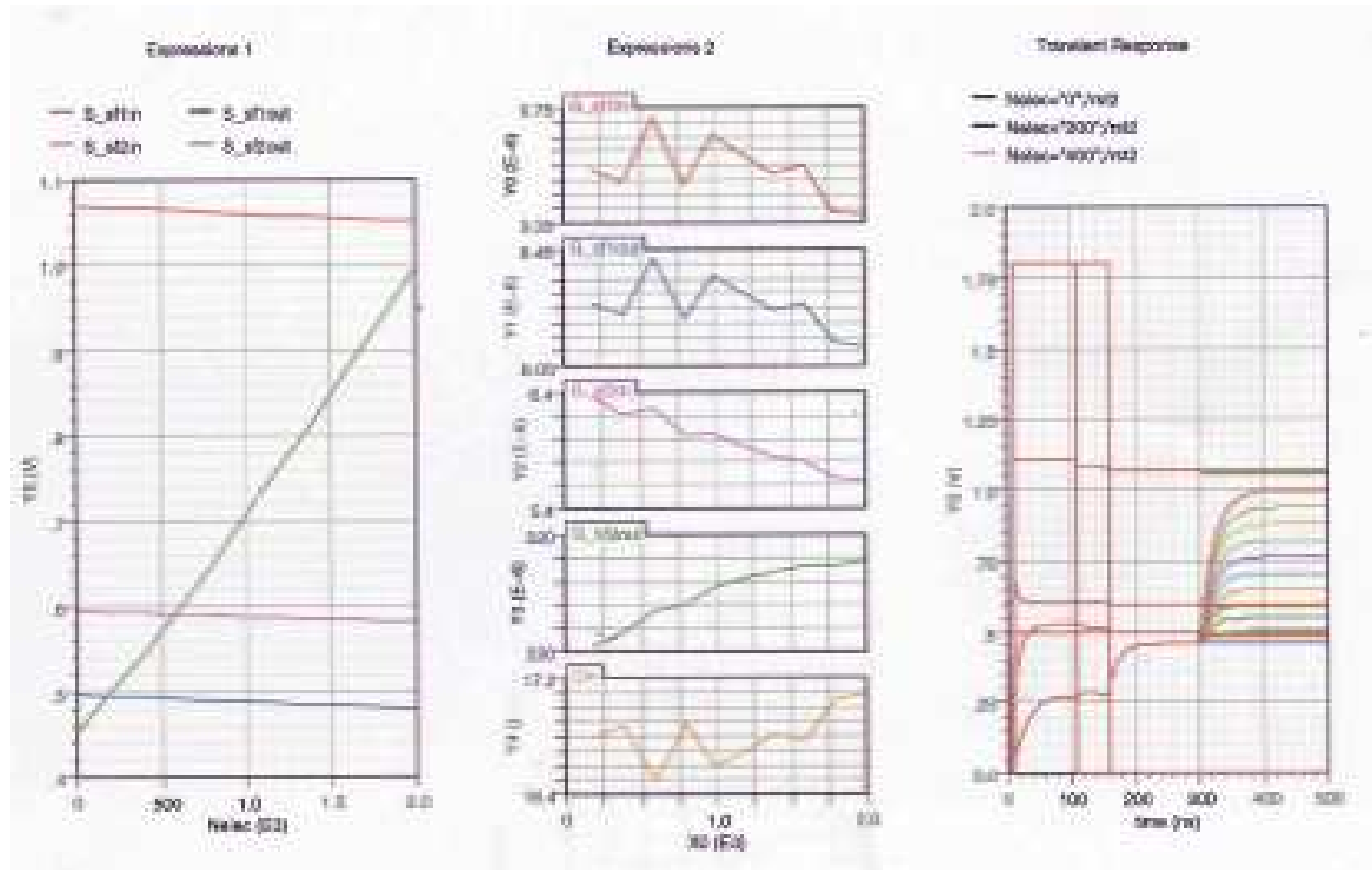
In pixel CDS. Switched capacitor version



In pixel CDS. Switched capacitor.

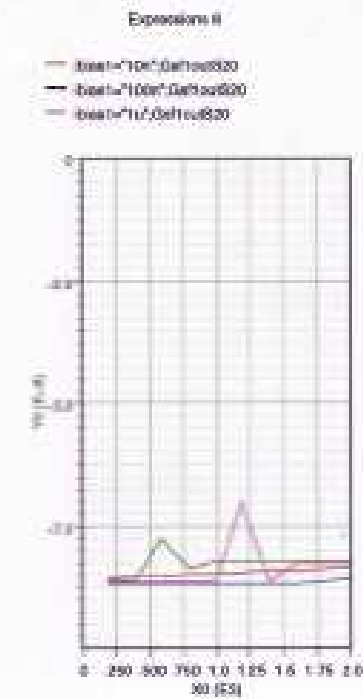
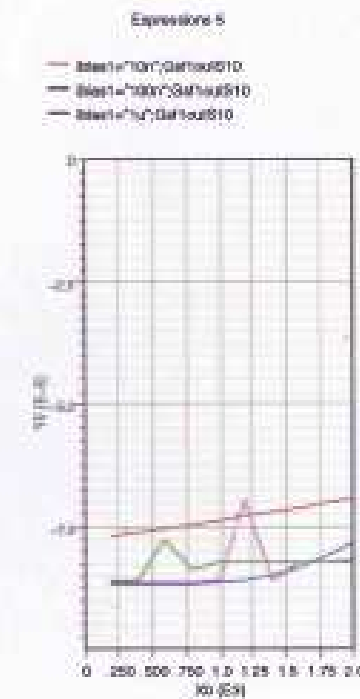
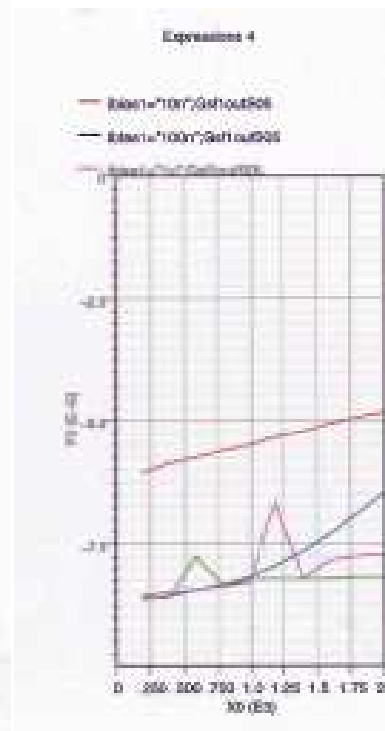
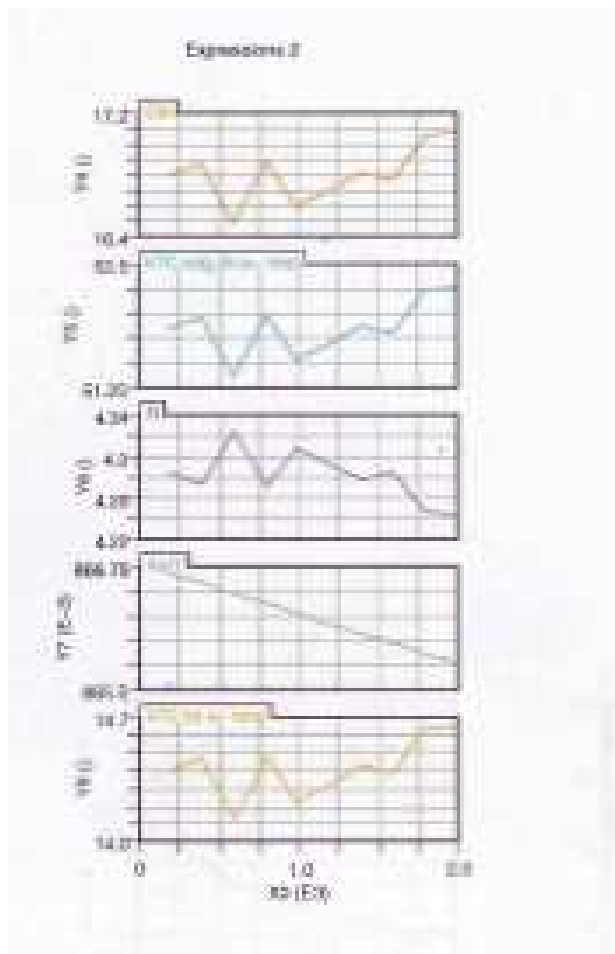


In pixel CDS. Charge amplifier



In pixel CDS. Charge amplifier

Similar CDS. Charge amplifier to provide gain



In pixel CDS. Charge amplifier. Summary.

Ø **CDS:** $\sqrt{\quad}$

Ø **Gain:** to be studied with correct pixel layout/capacitances

Ø **Power:** to be optimised

Ø **Bias:** to be optimised

Ø **Parameters fluctuations:** to be studied

In pixel CDS. Charge amplifier

Similar CDS. Charge amplifier to provide gain