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RD50-MPW1
Post-layout simulations

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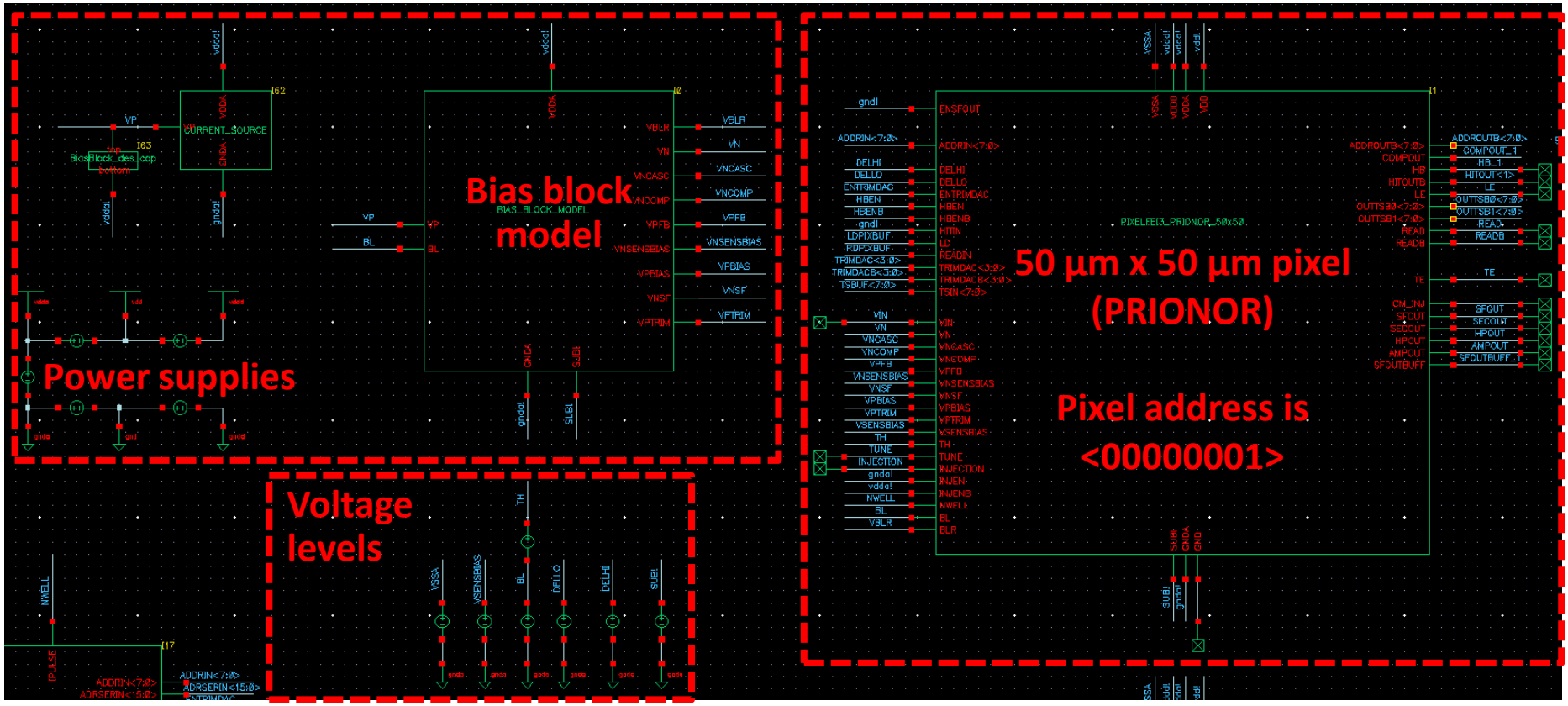
Testbench for one pixel – Schematic (I)



- **ADDROUTB<7:0>**, **OUTTSB0<7:0>** and **OUTTSB1<7:0>** are sent from the pixel output to the EOC input

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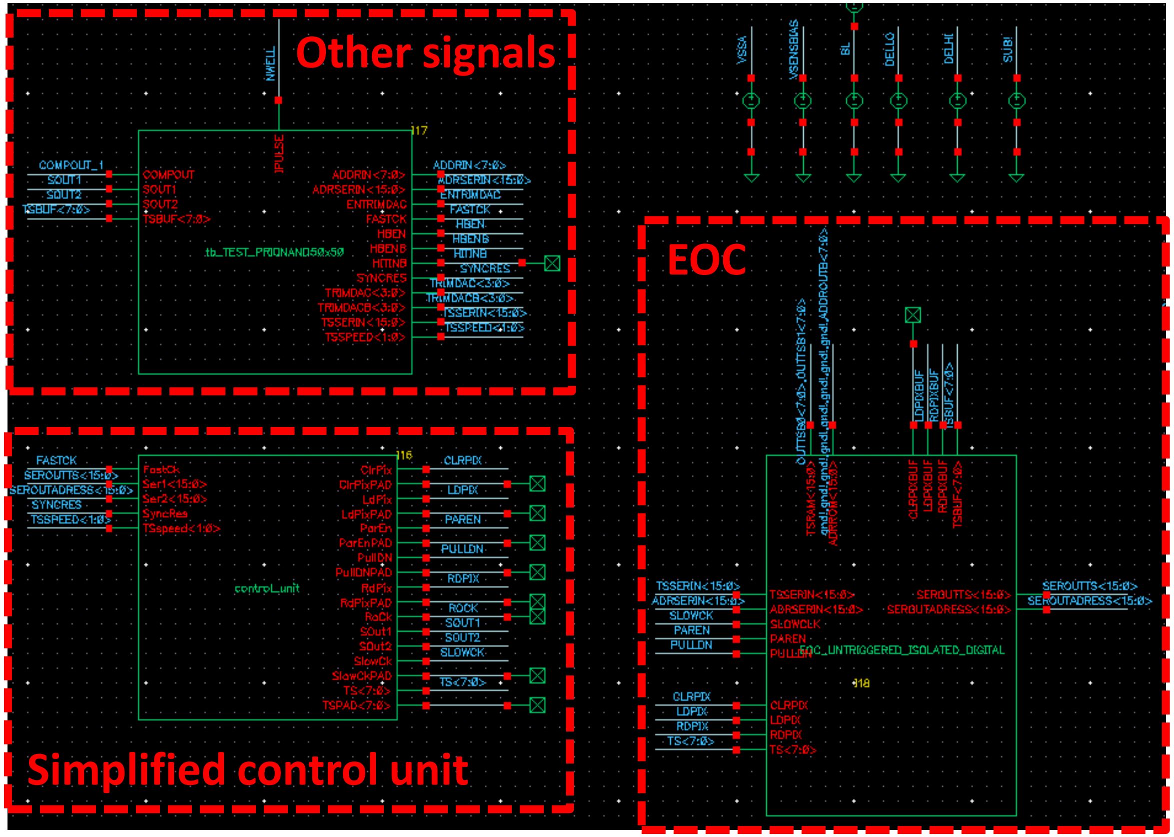
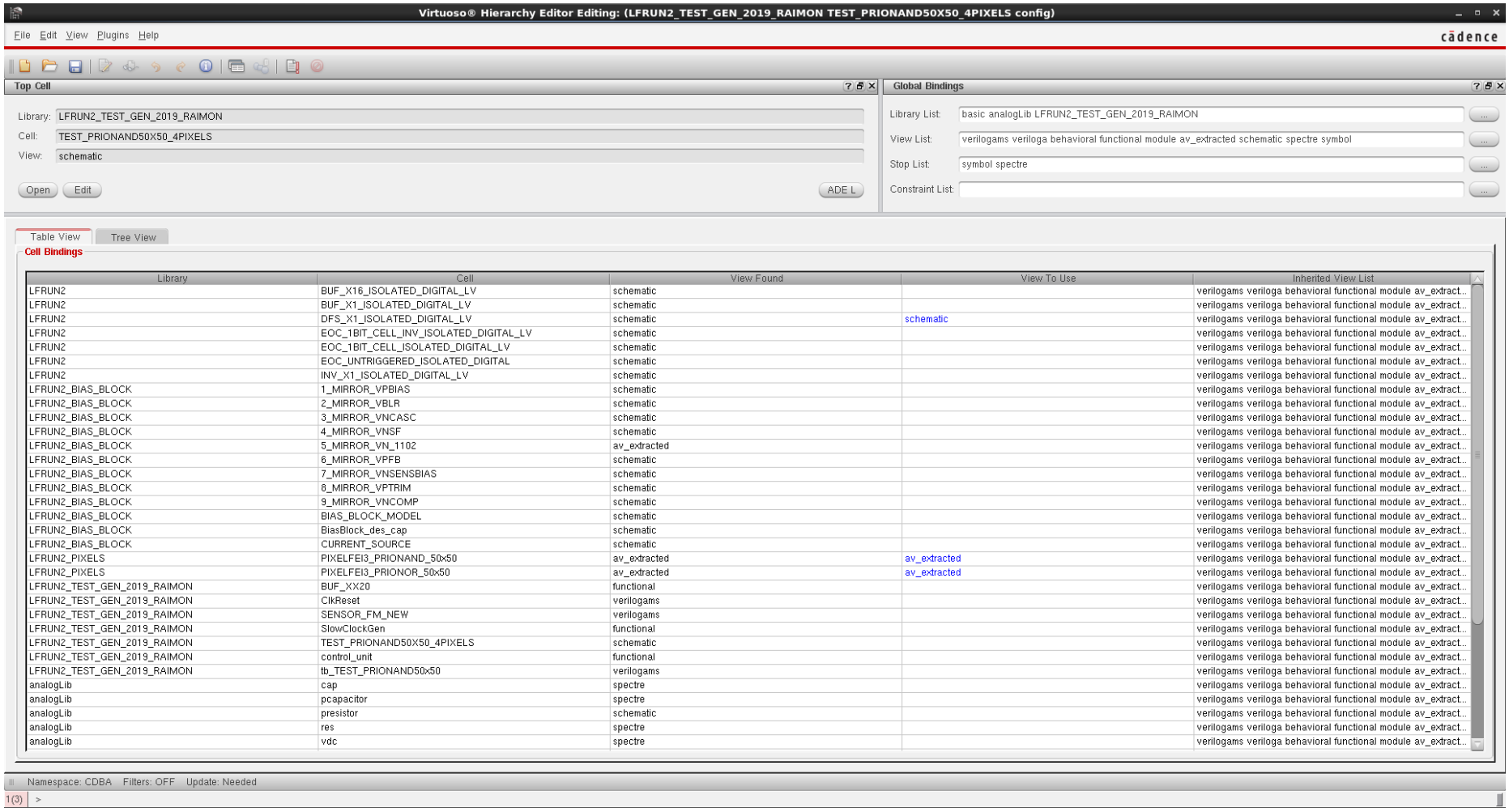
Testbench for one pixel – Schematic (II)

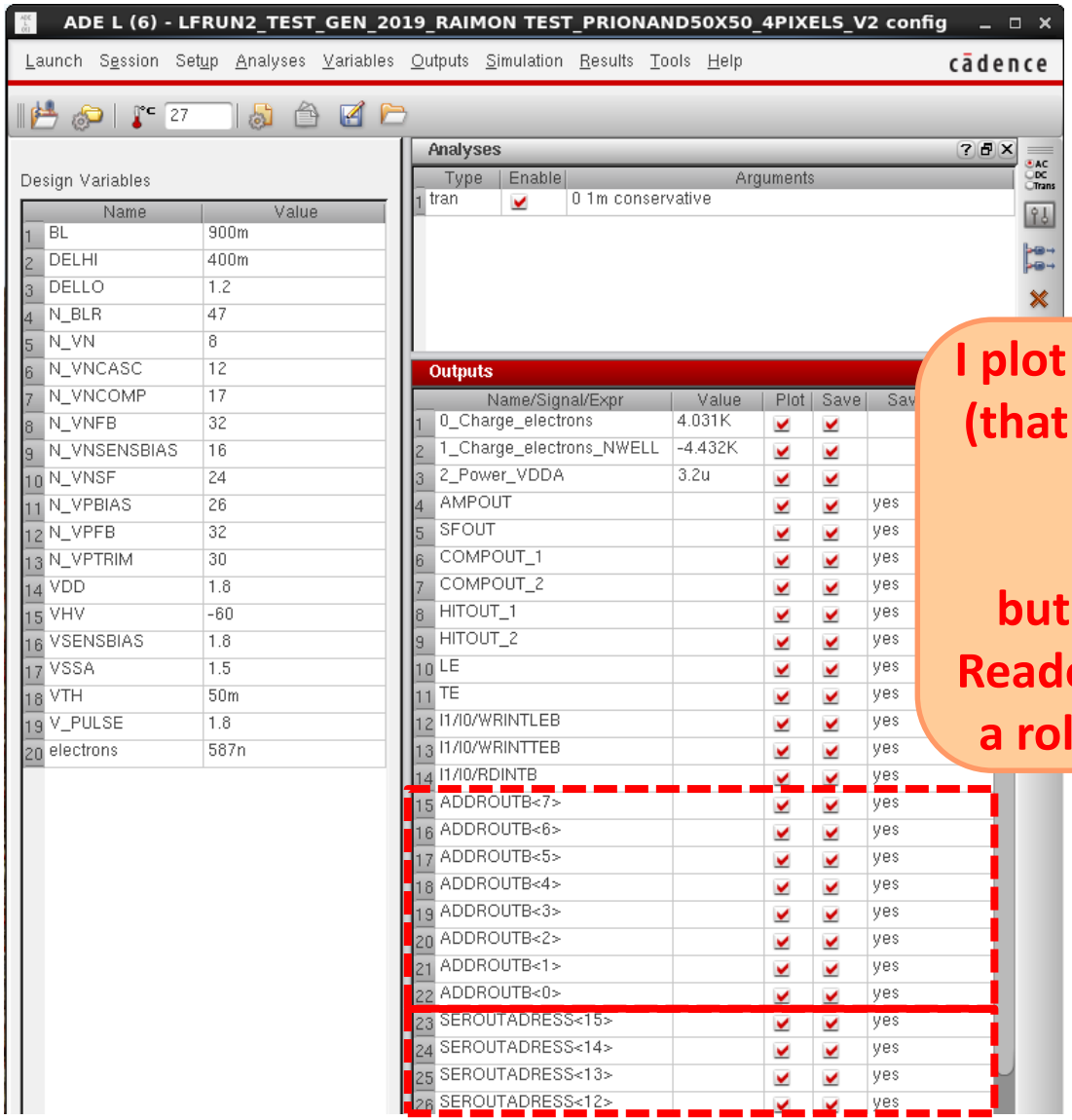


- There is one EOC circuit per column in the matrix (so, one EOC circuit in this testbench)

Testbench for one pixel – Config view

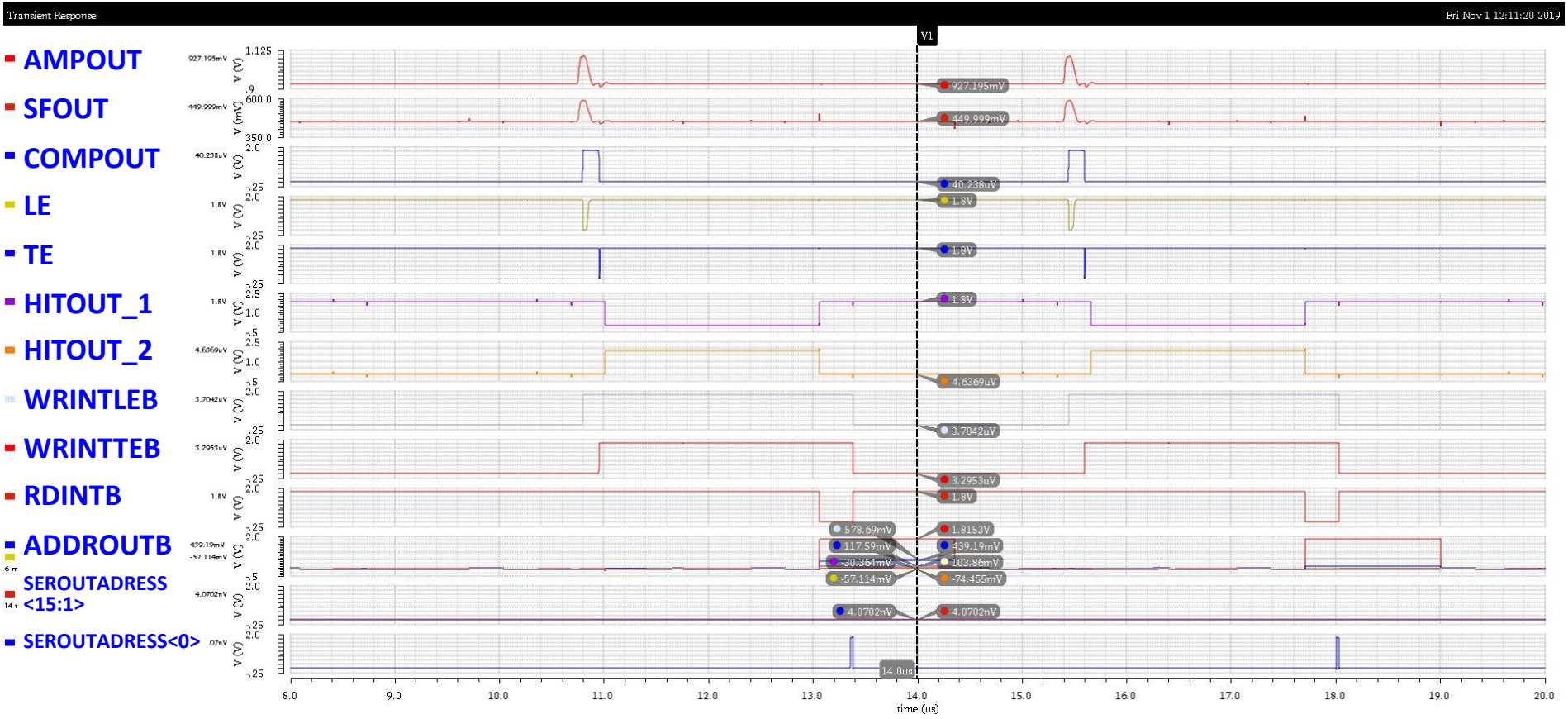


Testbench for one pixel – ADE

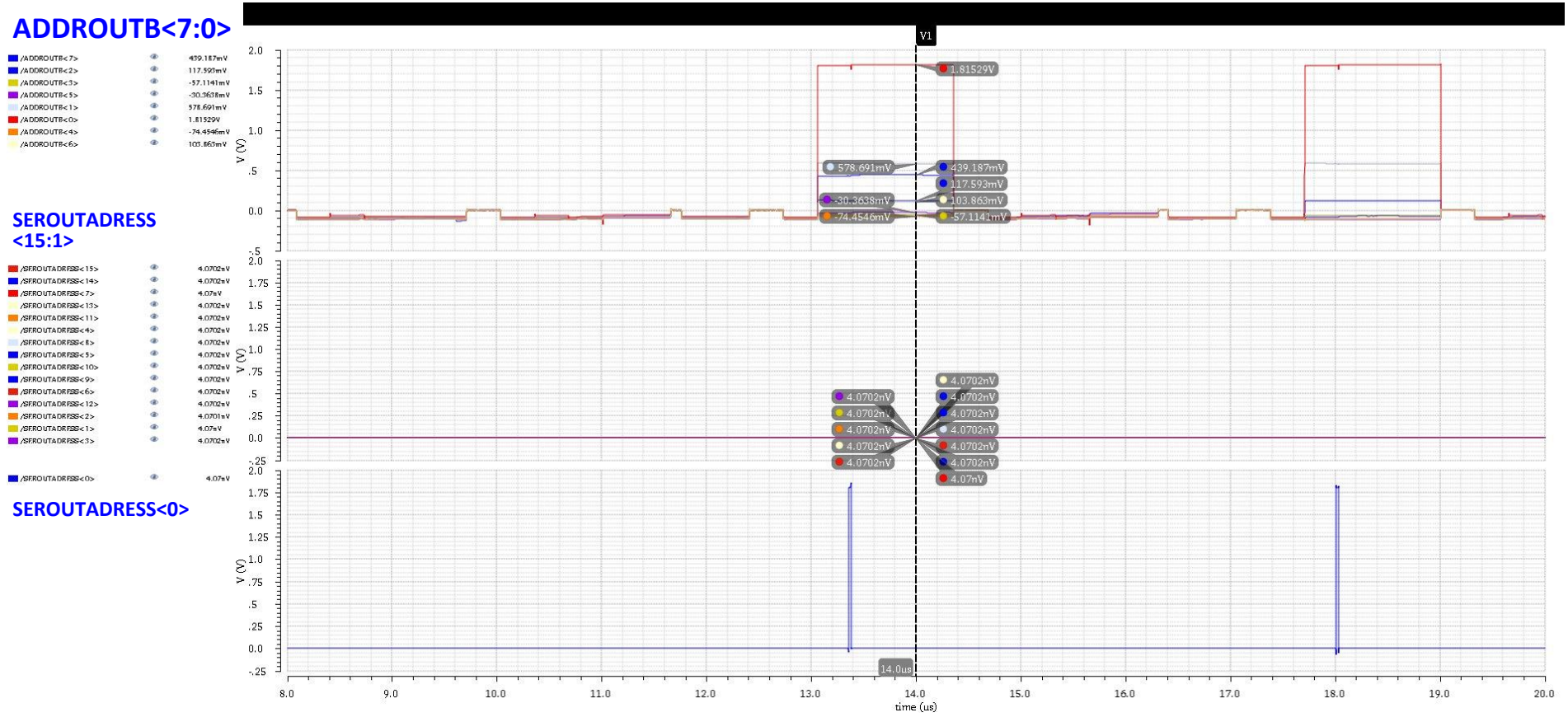


I plot the address of the pixel (that sees the particle hit) at
- pixel output
- EOC output,
but not at the CU output.
Readout speed does not play a role in these simulations.

Post-layout simulation – 2 pixels



Post-layout simulation – 2 pixels zoom

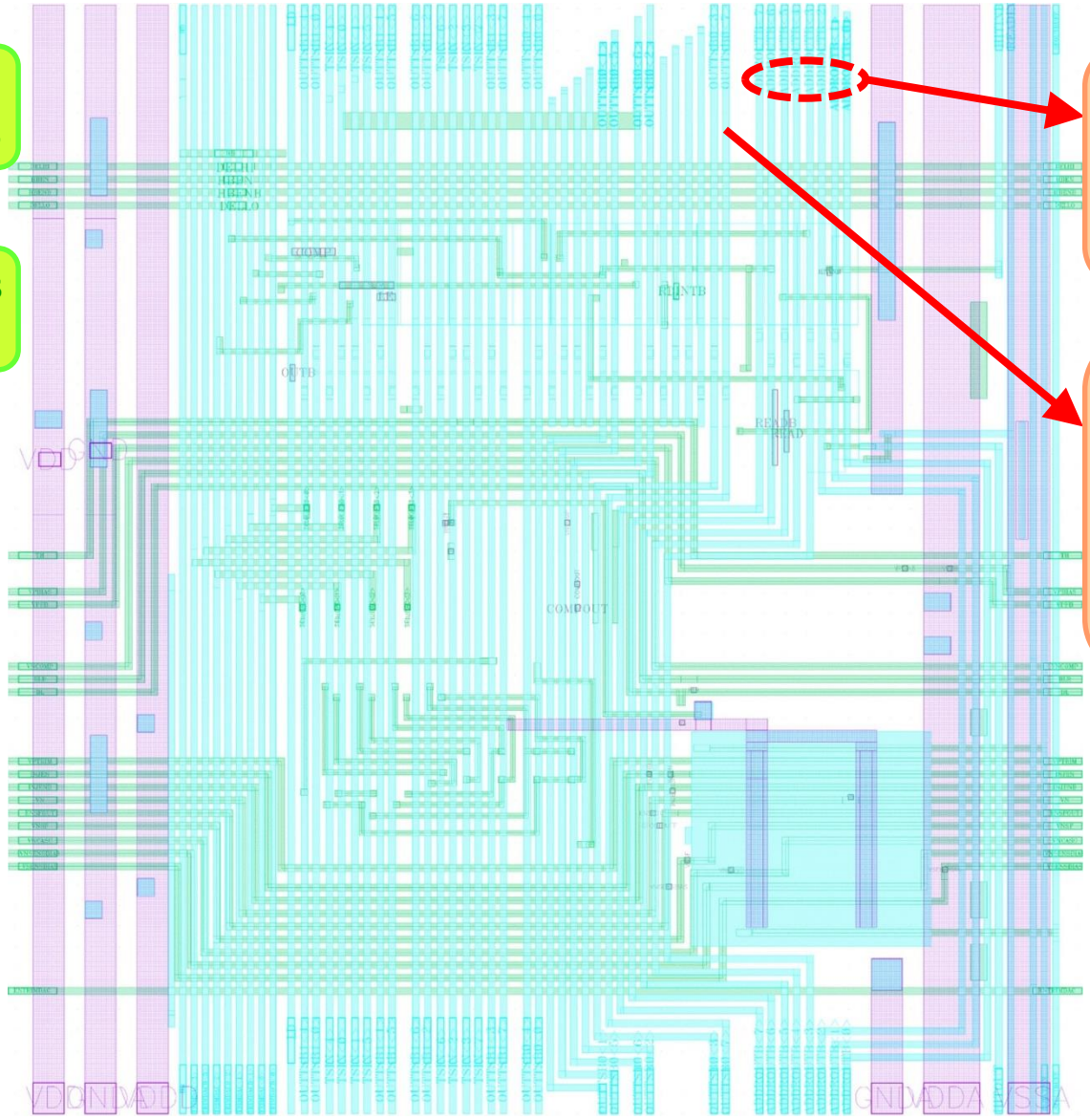


- There is some coupling between neighbouring lines: ADDROUTB<0> = 1.8 V and ADDROUTB<1> = 0.57 V (ADDROUTB<1> should be 0 V, as ADDROUTB = <00000001>)

Pixel layout

I only show the metal routing lines

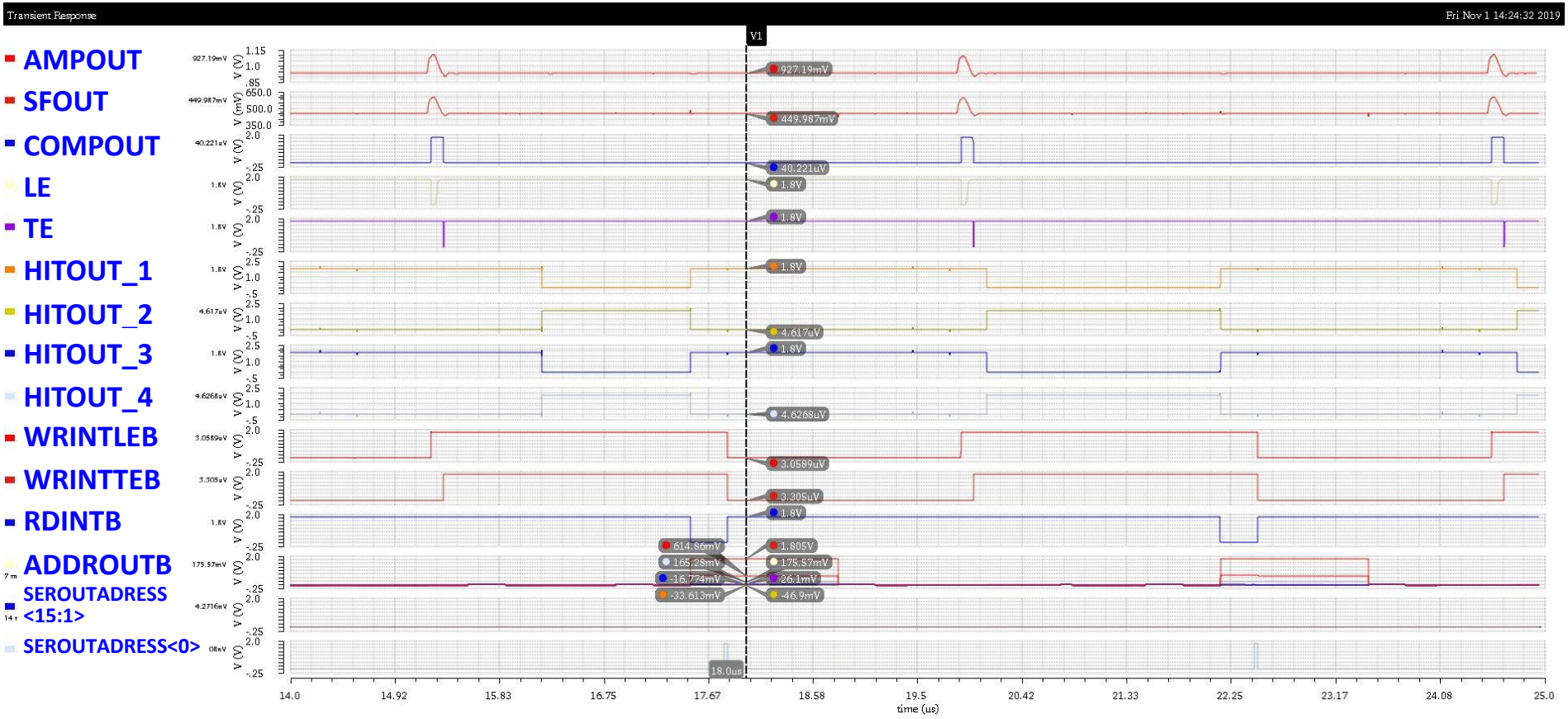
Metal routing lines = 0.32 µm



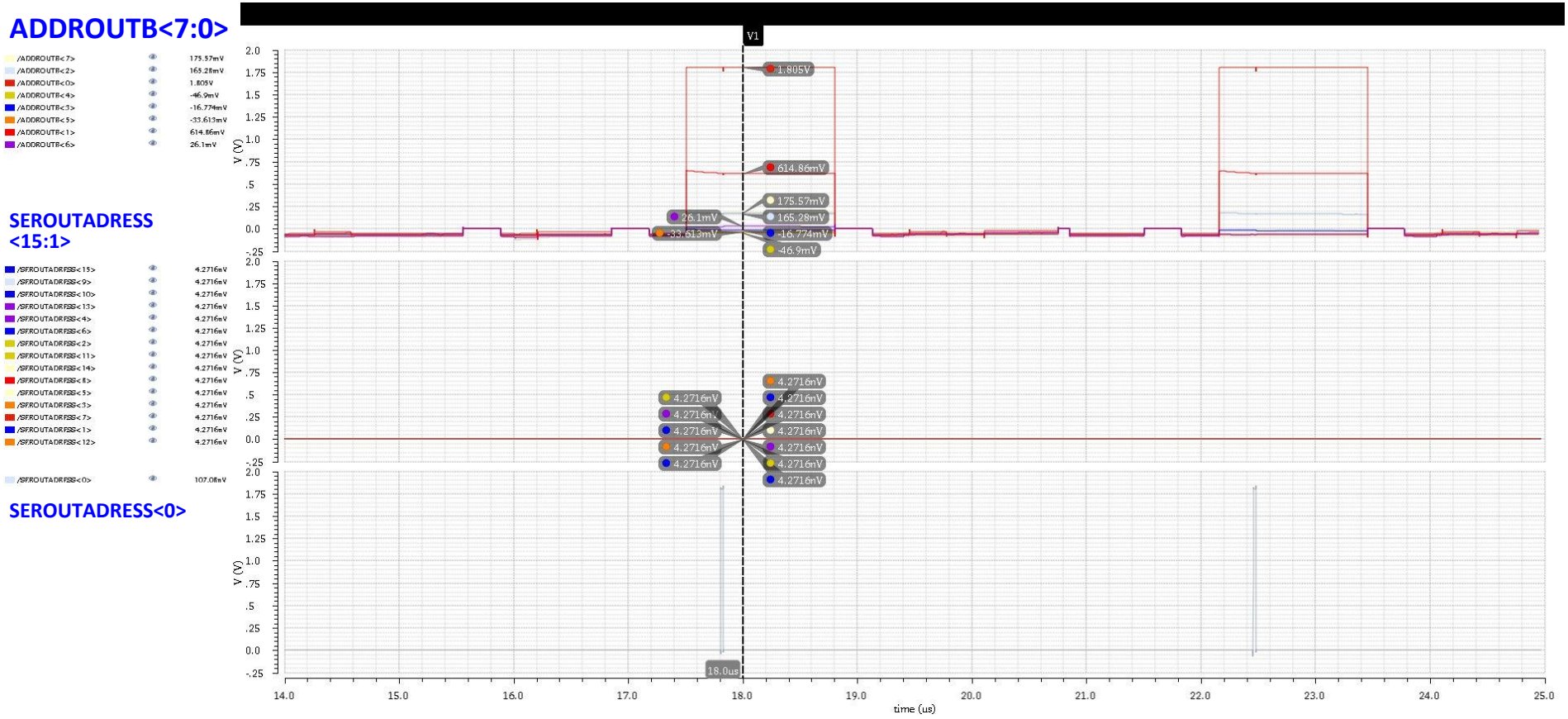
These lines are ADDROUTB<7:0> (7 = left, 0 = right). Spacing between them is 0.32 µm.

This line is OUTTSB0<7> (time-stamp). There is xtalk between OUTTSB0<7> and ADDROUTB<7>.

Post-layout simulation – 4 pixels

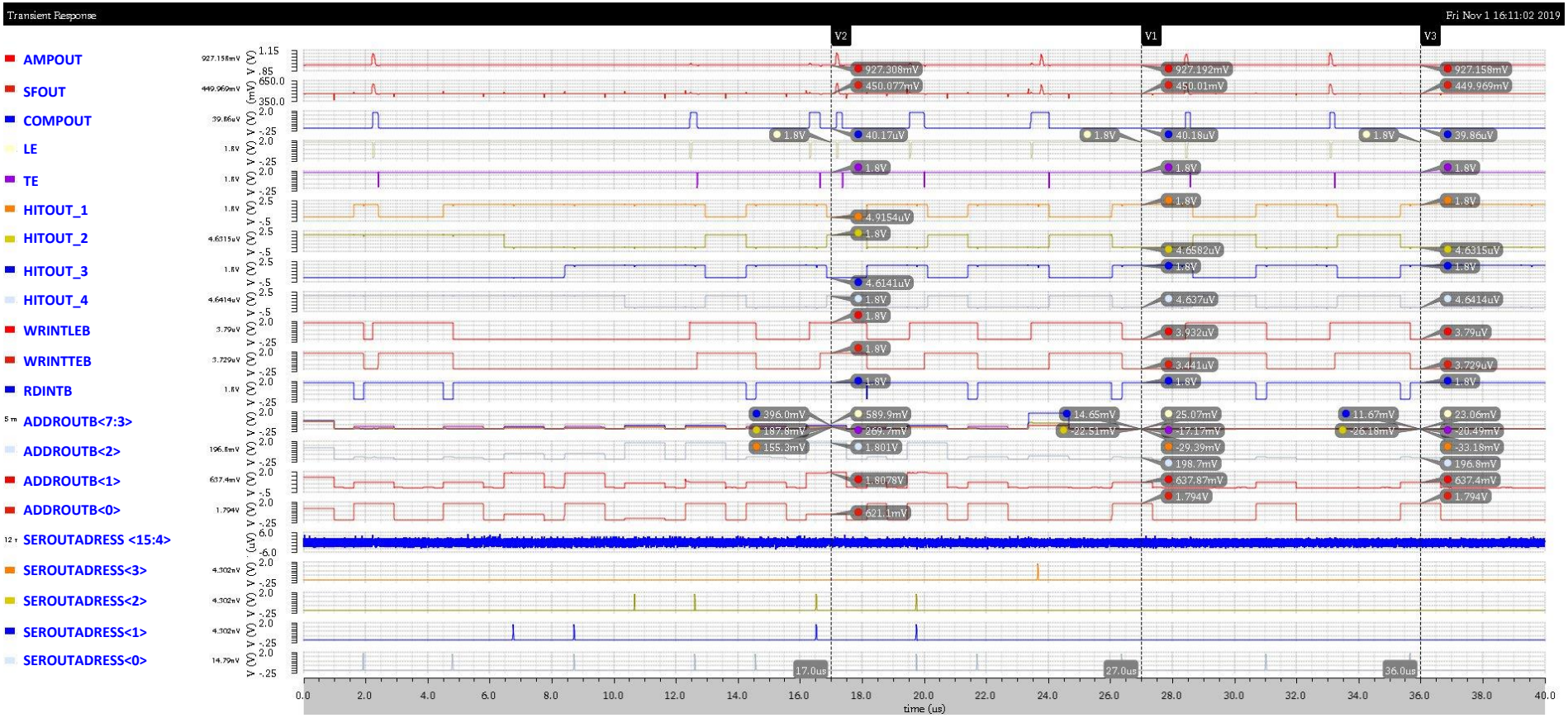


Post-layout simulation – 4 pixels zoom



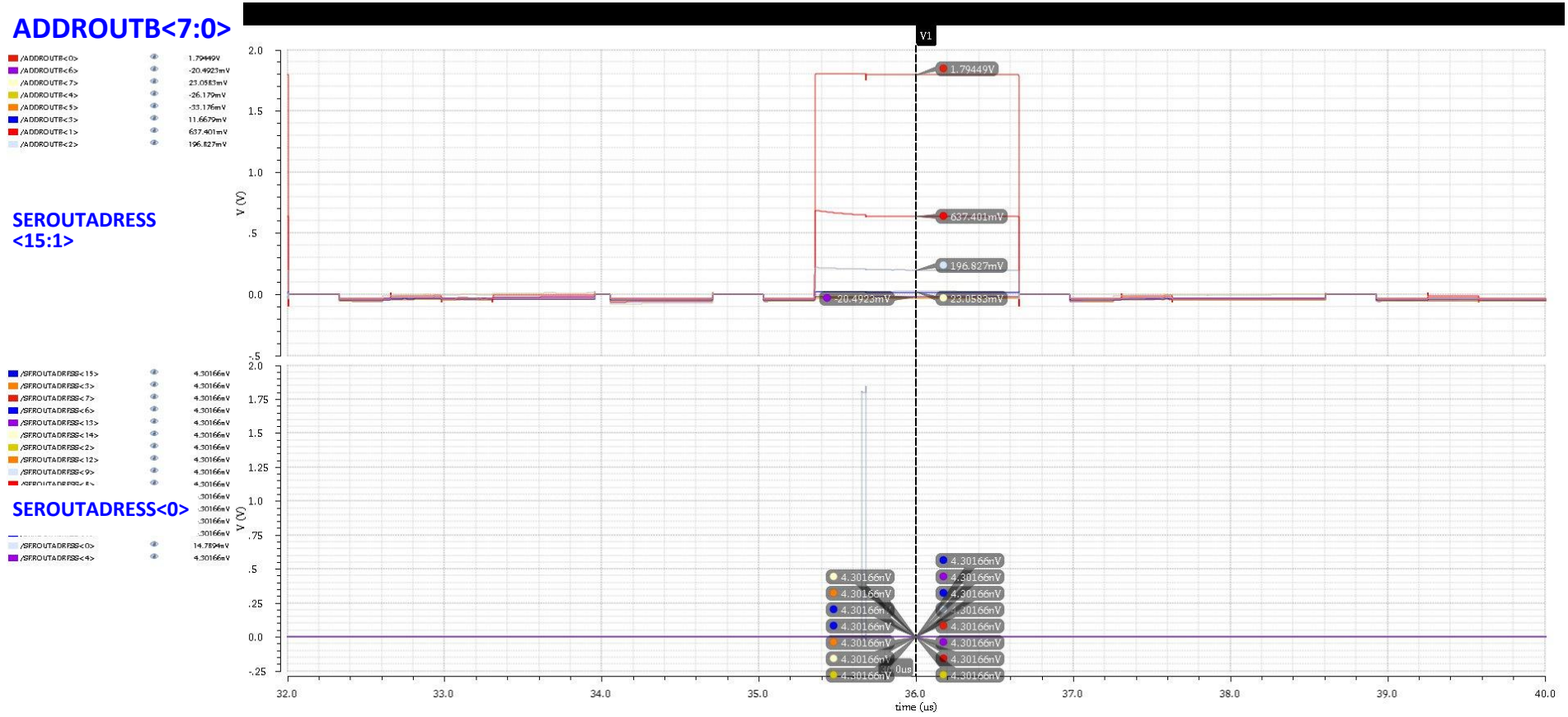
- The voltage of ADDROUTB<1> increases with the number of pixels in the simulation!
- But still it is not enough to flip the bit, as SEROUTADRESS<1> = '0'.

Post-layout simulation – 8 pixels



- I don't understand what is going on from 0 to 24 - 26 µs. It seems some sort of *initial transient* (it also happens when there are less pixels, but it is a lot shorter).

Post-layout simulation – 8 pixels zoom



- ADDROUTB<0> = 1.8 V and ADDROUTB<1> = 0.63 V
- Still no bit flipping in SEROUTADRESS (after the *initial transient*)

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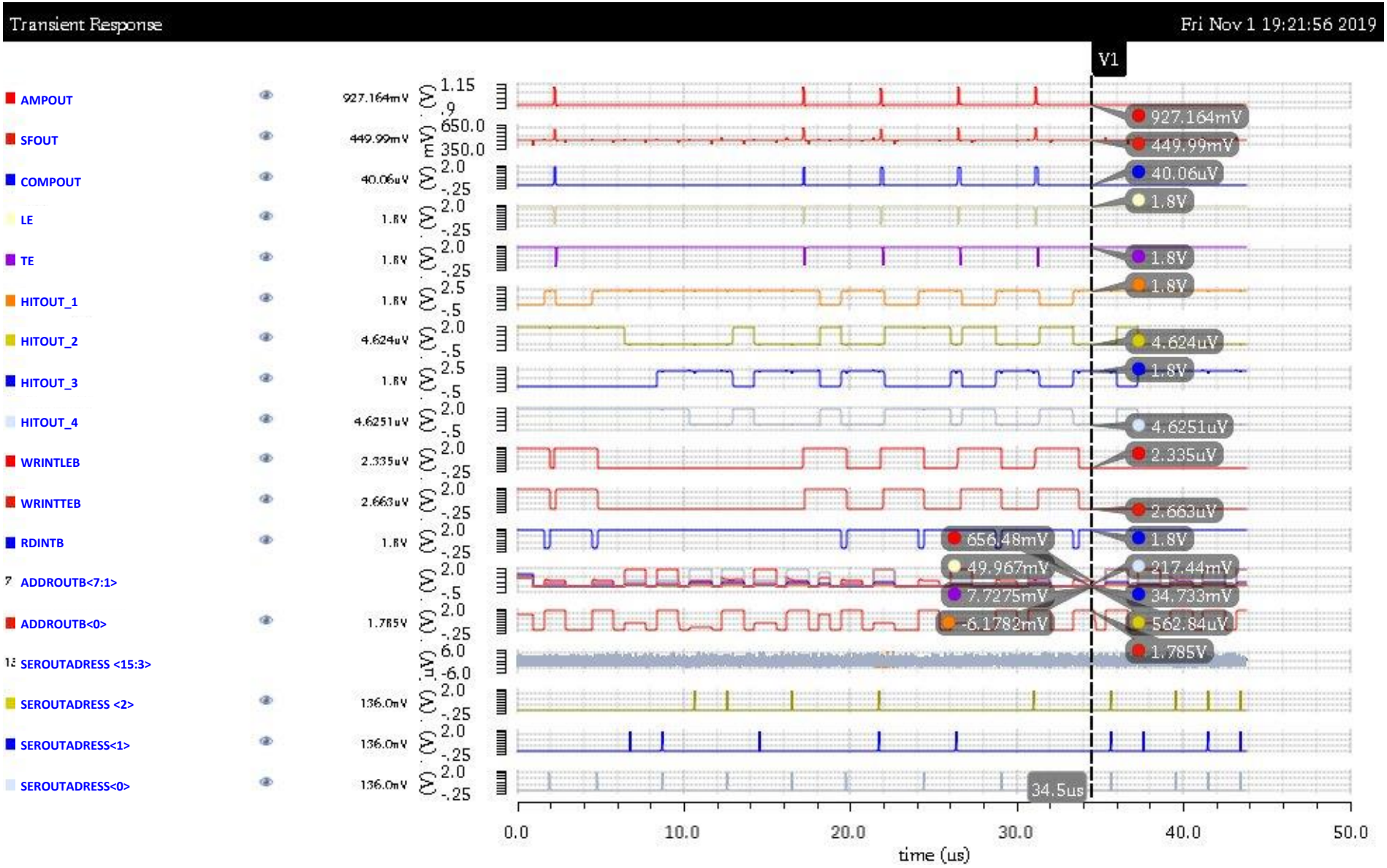
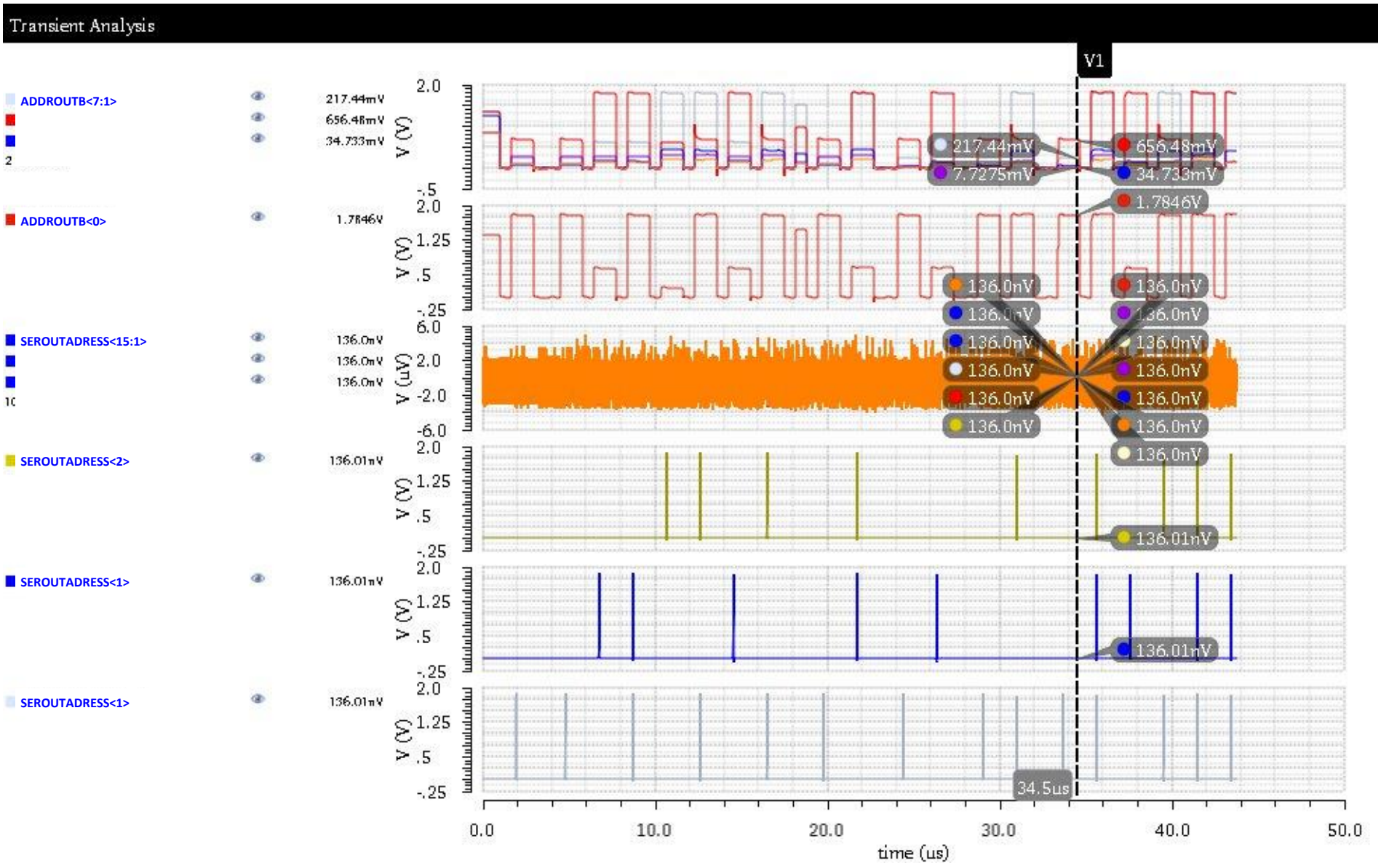
Post-layout simulation – 16 pixels

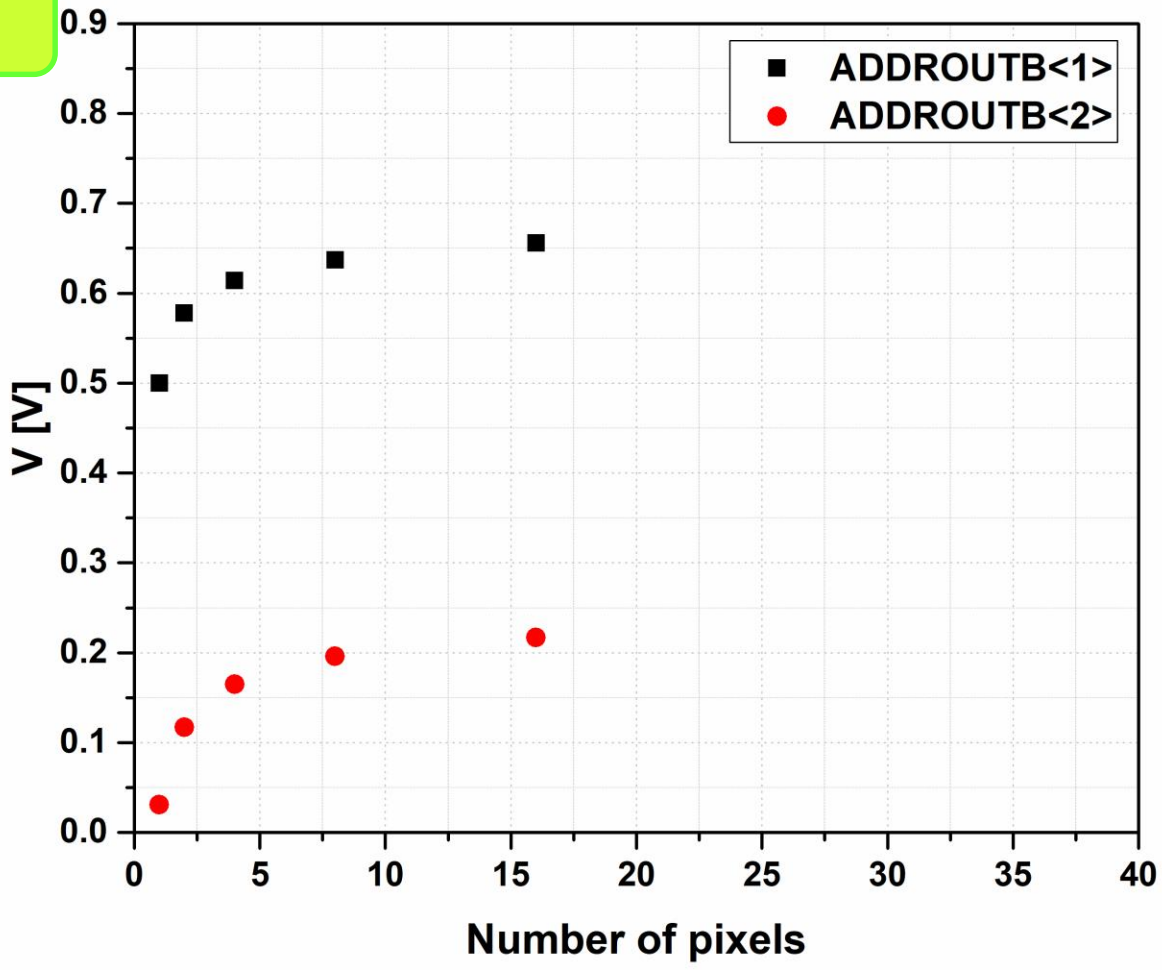


Post-layout simulation – 16 pixels



Post-layout simulation

ADDROUTB<0> = 1.8 V



ΔV = ΔQ/C
I always inject the same amount of charge (4k e^-) to one pixel. I should see a linear behaviour?