

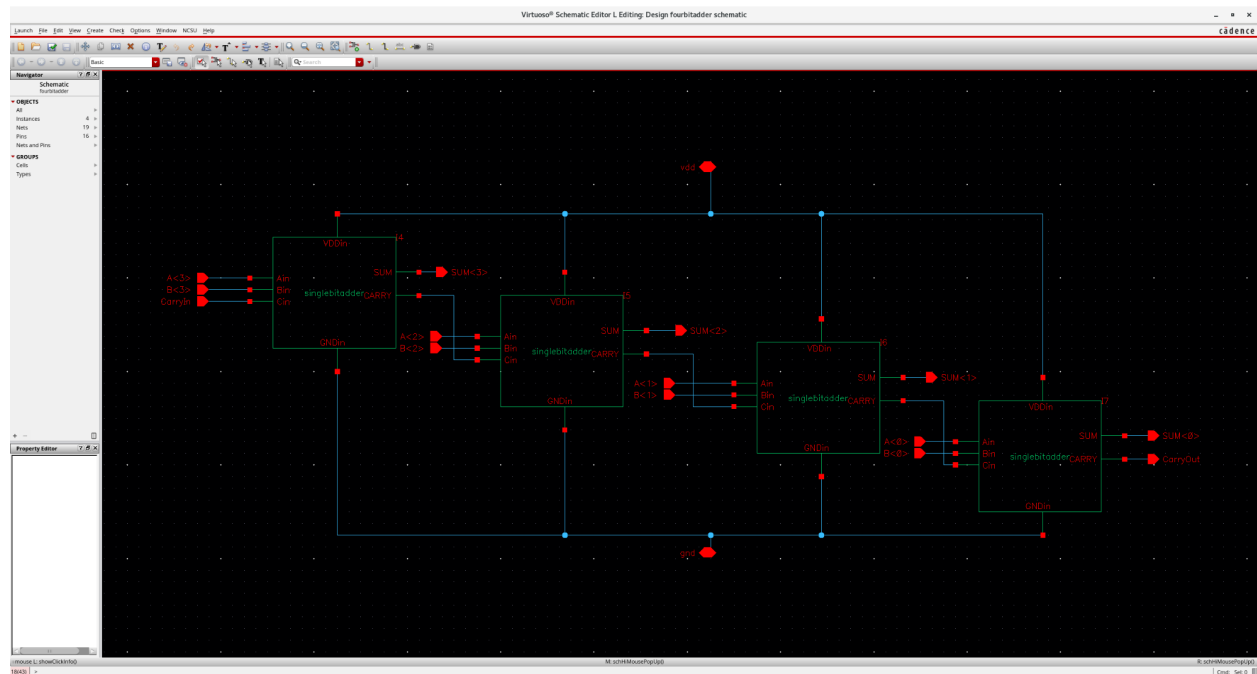
ECEN 454

Lab 5

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Section 505 - Rahul

## Four-bit adder: Schematic:



## Layout:



## LVS report:

Open

si.out  
~/ecen454/LVS

Save

```
Net-list summary for /home/ugrads/r/roberto.jluis/ecen454/LVS/layout/netlist
count
  91      nets
  16      terminals
  72      pmos
  72      nmos

Net-list summary for /home/ugrads/r/roberto.jluis/ecen454/LVS/schematic/netlist
count
  91      nets
  16      terminals
  72      pmos
  72      nmos

Terminal correspondence points
N82      N11      A<0>
N79      N3       A<1>
N77      N5       A<2>
N75      N12      A<3>
N90      N0       B<0>
N89      N2       B<1>
N88      N8       B<2>
N87      N13      B<3>
N86      N1       CarryIn
N84      N4       CarryOut
N85      N14      SUM<0>
N83      N6       SUM<1>
N80      N10      SUM<2>
N78      N9       SUM<3>
N81      N7       gnd
N76      N16      vdd

Devices in the netlist but not in the rules:
pcapacitor
Devices in the rules but not in the netlist:
cap nfet pfet nmos4 pmos4

The net-lists match.

              layout schematic
              instances
un-matched    0      0
rewired       0      0
size errors   0      0
pruned        0      0
active        144    144
total         144    144

              nets
un-matched    0      0
merged        0      0
pruned        0      0
active        91     91
total         91     91

              terminals
un-matched    0      0
matched but   |
different type
total         16     16
```

Plain Text ▾ Tab Width: 8 ▾ Ln 66, Col 38 ▾ INS

Test 1 waveform:



Delay:

|          |         |
|----------|---------|
| SUM<3>   | .4 ns   |
| SUM<2>   | .62 ns  |
| SUM<1>   | .849 ns |
| SUM<0>   | 1.07 ns |
| CarryOut | 1.13 ns |

Power:

Virtuoso (R) Visualization & Analysis XL Table

- □ ×

File Edit View Tools Help

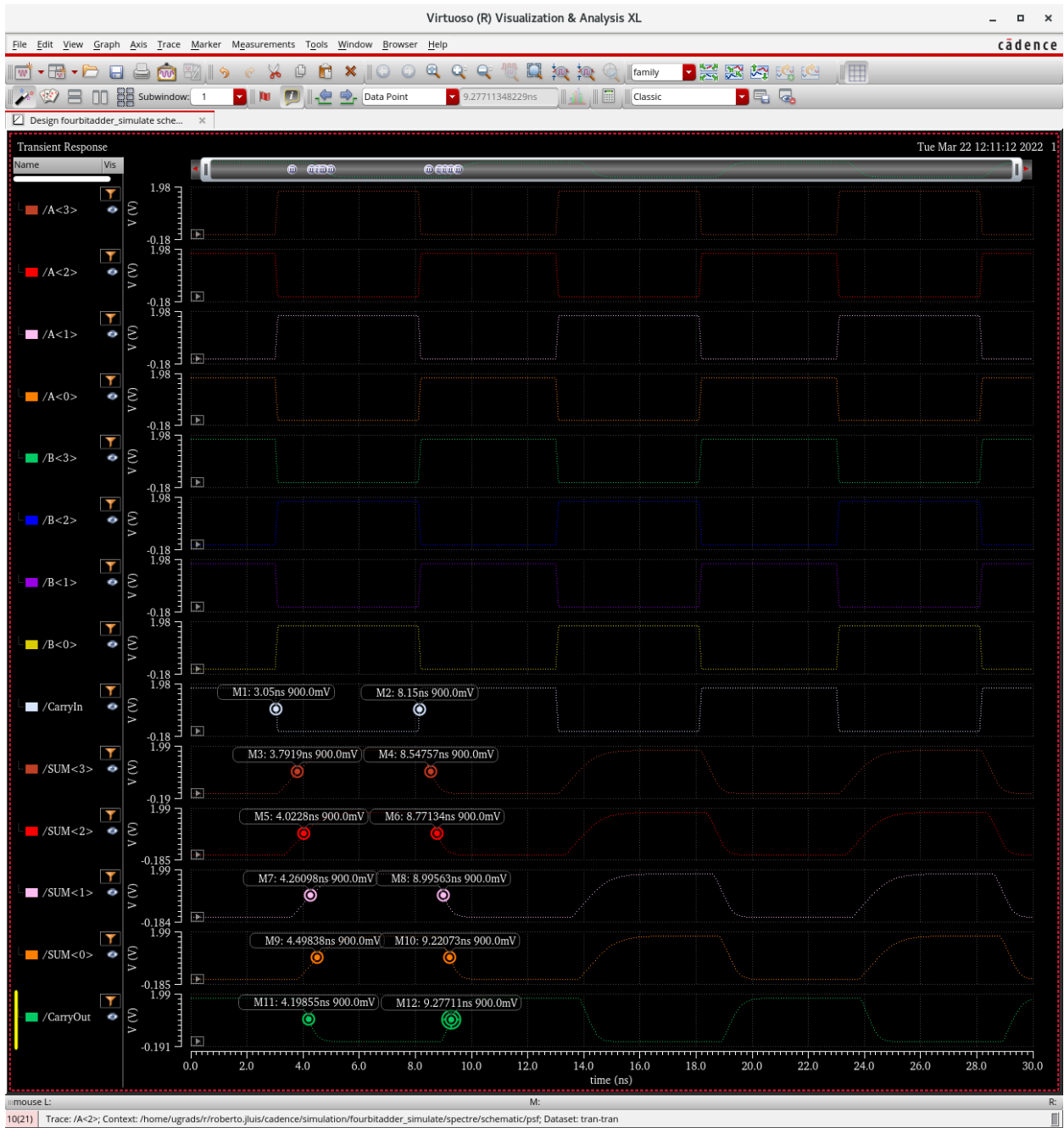
cadence

average(i("/V9/PLUS" ?result "tran"))...

| Expression                              | Value     | Expression                                | Value     |
|---|-----------|---|-----------|
| 1 average(i("/V9/PLUS" ?result "tran")) | -81.67E-6 | average(i("/V9/PLUS" ?result "tran"))*1.8 | -147.0E-6 |

16 | Trace: /A<0>; Context: /home/ugrads/r/roberto.jluis/cadence/simulation/fourbitadder\_simulate/spectre/schematic/psf;

Test 2 waveform:



Delay:

|          |          |
|----------|----------|
| SUM<3>   | .74 ns   |
| SUM<2>   | .97 ns   |
| SUM<1>   | 1.21 ns  |
| SUM<0>   | 1.448 ns |
| CarryOut | 1.148 ns |

Power:

Virtuoso (R) Visualization & Analysis XL Table

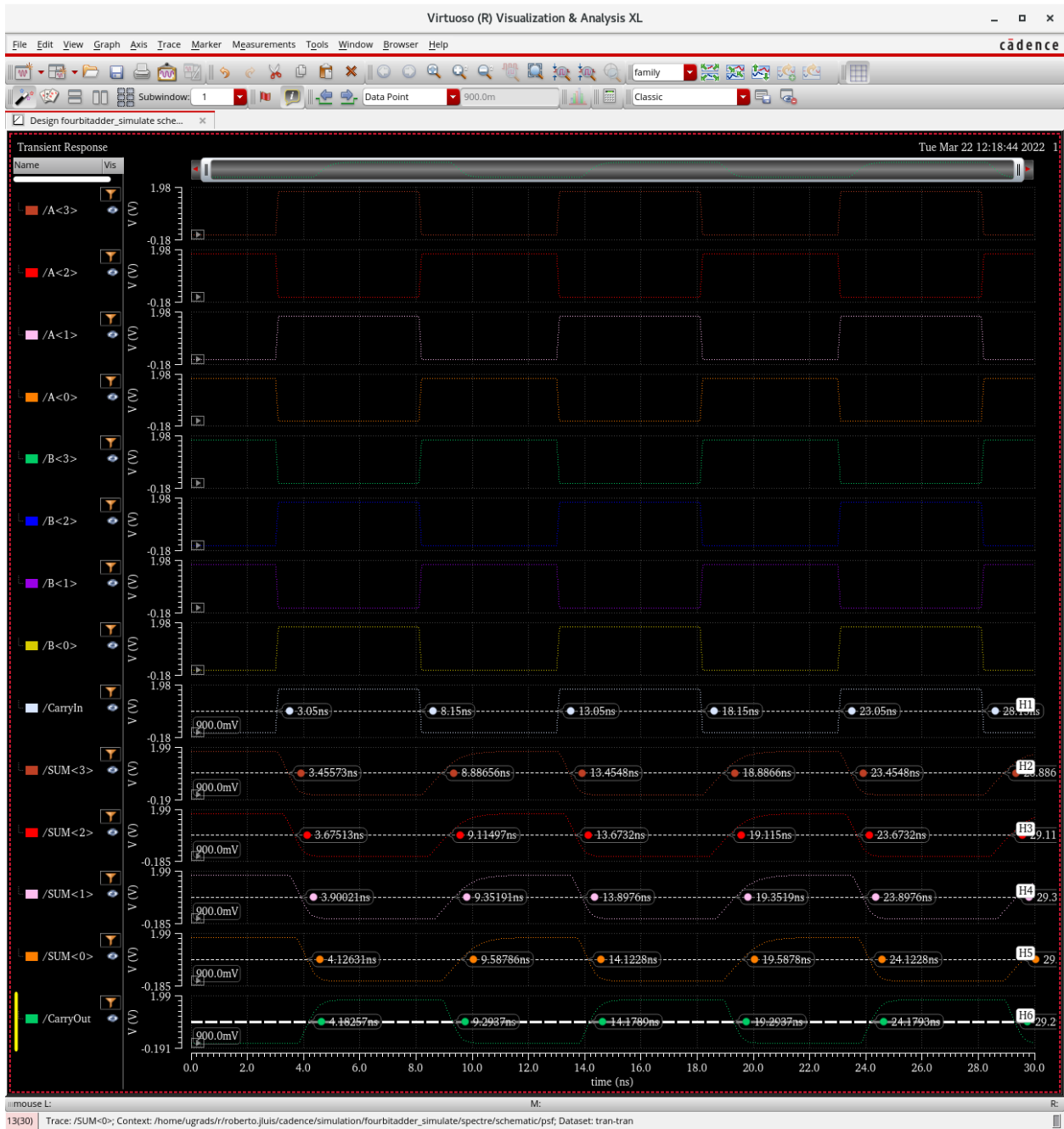
File Edit View Tools Help cadence

average(i("/V9/PLUS" ?result "tran"))...

| Expression                                  | Value     |
|---|-----------|
| 1 average(i("/V9/PLUS" ?result "tran"))*1.8 | -150.2E-6 |

25 Trace: /A<2>; Context: /home/ugrads/r/roberto.jluis/cadence/simulation/fourbitadder\_simulate/spectre/schematic/psf;

### Test 3 waveform:





Delay:

|          |          |
|----------|----------|
| SUM<3>   | .41 ns   |
| SUM<2>   | .625 ns  |
| SUM<1>   | .849 ns  |
| SUM<0>   | .85 ns   |
| CarryOut | 1.132 ns |

Power:

Virtuoso (R) Visualization & Analysis XL Table

File Edit View Tools Help

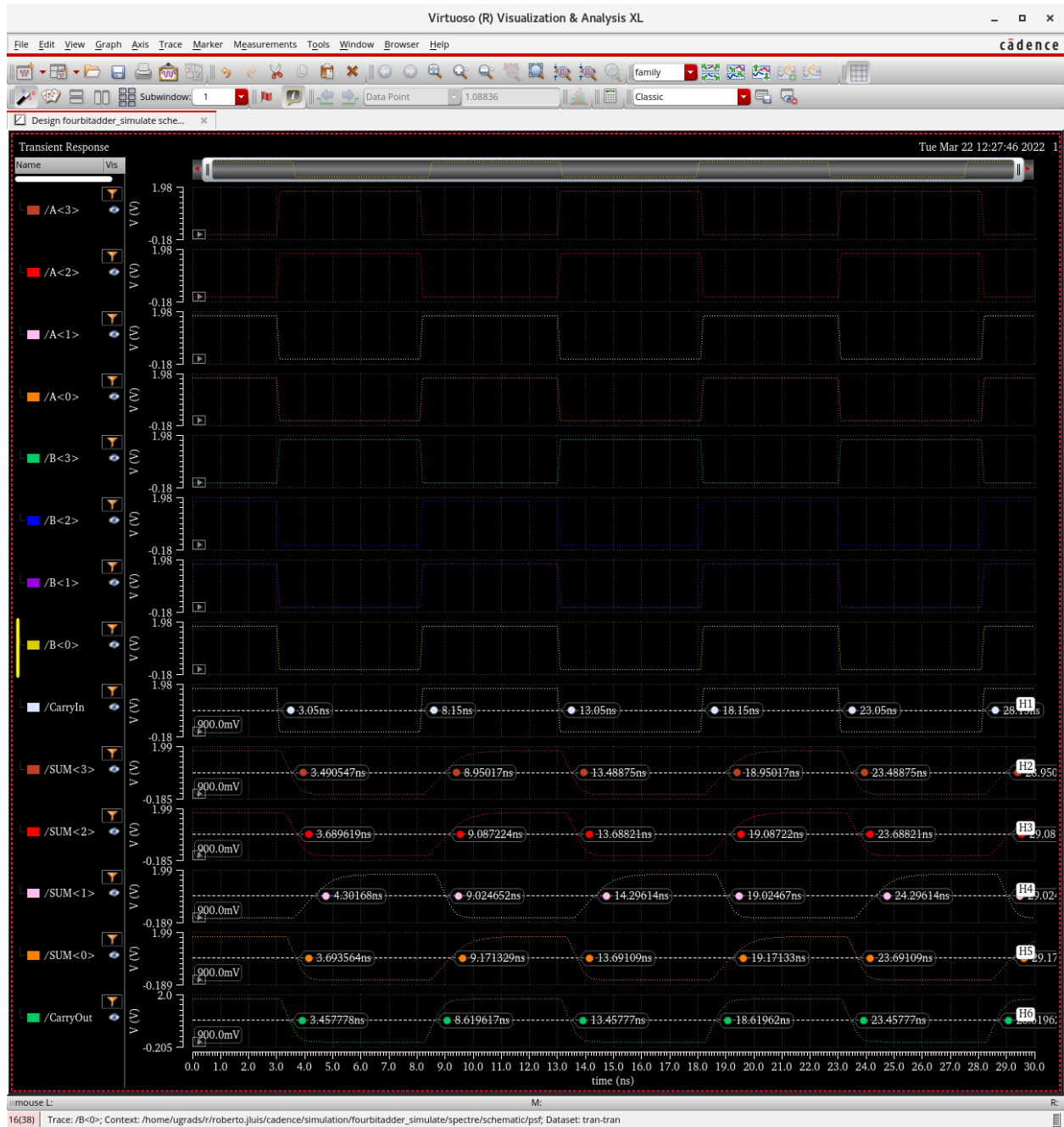
cadence

average(i("/V9/PLUS" ?result "tran"))...

| Expression                                  | Value     |
|---|-----------|
| 1 average(i("/V9/PLUS" ?result "tran"))*1.8 | -147.0E-6 |

33 Trace: /A<1>; Context: /home/ugrads/r/roberto.jluis/cadence/simulation/fourbitadder\_simulate/spectre/schematic/psf;

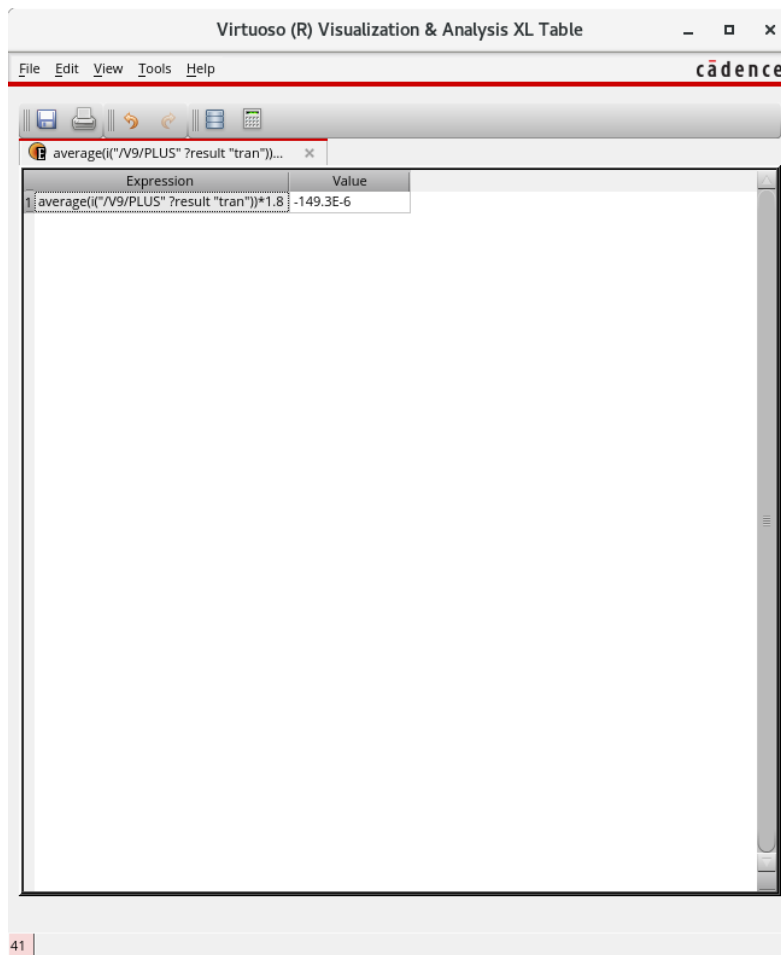
Test 4 waveform:



Delay:

|          |          |
|----------|----------|
| SUM<3>   | .44 ns   |
| SUM<2>   | .639 ns  |
| SUM<1>   | 1.251 ns |
| SUM<0>   | .64 ns   |
| CarryOut | .407 ns  |

Power:



Virtuoso (R) Visualization & Analysis XL Table

File Edit View Tools Help

average((I"/V9/PLUS" ?result "tran"))\*1.8

| Expression                                   | Value     |
|--|-----------|
| 1: average((I"/V9/PLUS" ?result "tran"))*1.8 | -149.3E-6 |

41