

Implementation of receiver macromodel with supply port: second tests

I. HYPOTHESIS

- The input (IP) and supply (SP) ports of the receiver are physically separated,
- new macromodel of the DDR for the input and supply ports,
- the constant supply voltage is applied inside the macromodel.

II. RESULTS

Fig. 1 shows the modeled structure in the TLM code. The dimensions are specified with the discretisation step $dl = 1\text{mm}$. The strip is zero-thickness and perfectly conducting, the substrate is assumed lossless. The configuration is surrounded by absorbing boundary conditions in the lateral and top directions, and a perfect electric conductor one at the substrate back.

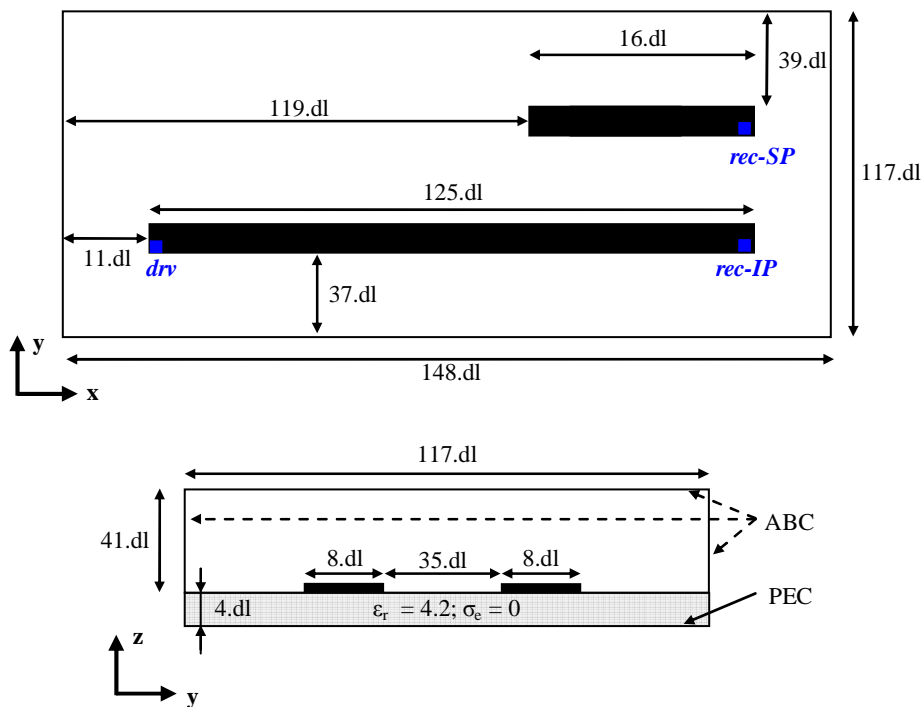


Figure 1: First test microstrip structure

The main strip is fed by the driver of a DDR (left side) distributed as specified in Fig. 2a). The load consists of the receiver input port of the same DDR (Fig. 2 b)).

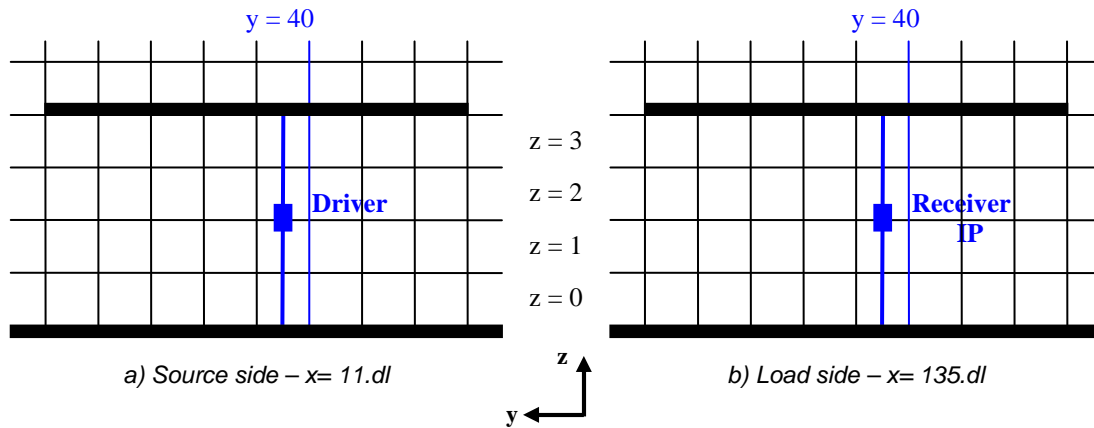


Figure 2: Distribution of the feed and load on the main strip

The supply strip is short-circuited at the place of the 1.8V constant supply (Fig. 3a)), that is directly applied under the solution search function. The track is loaded with the supply port macromodel (Fig. 3d)). All the macromodels are spread over several cells.

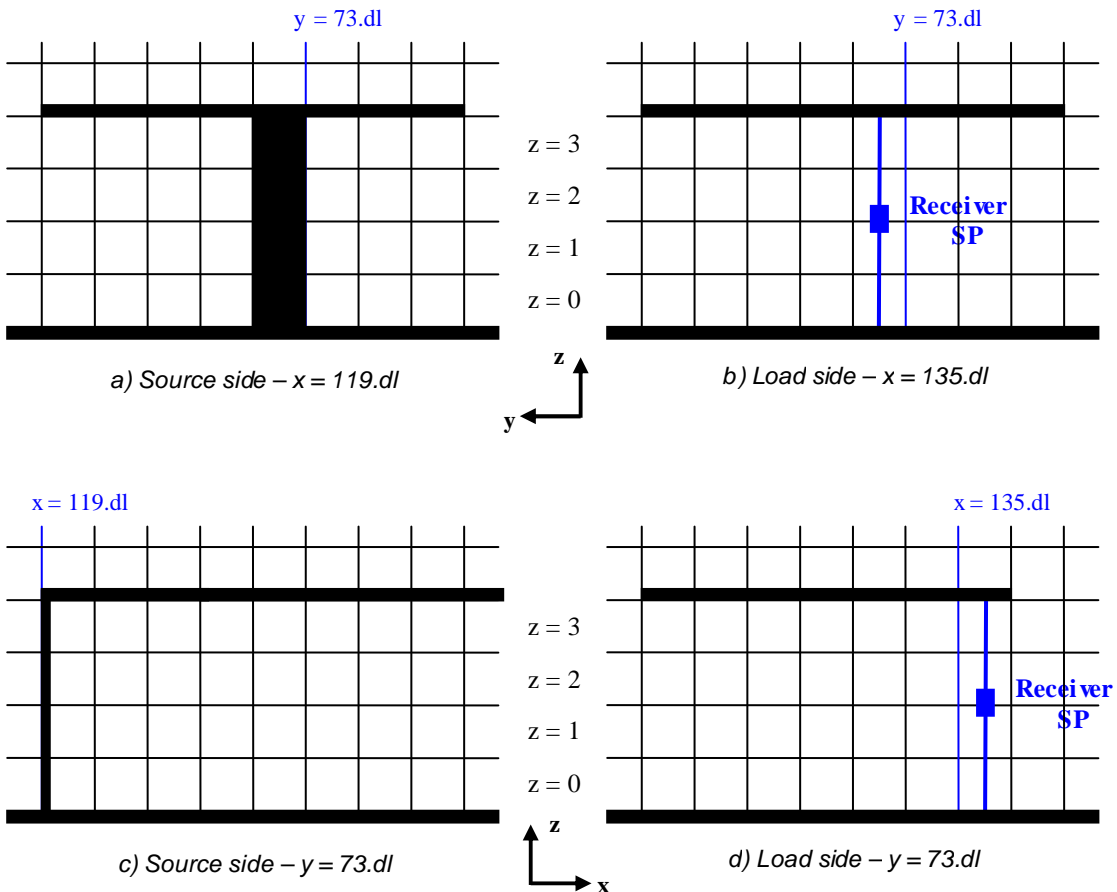


Figure 3: Supply strip

The voltages are presented in Fig. 4 as well as that ones got with the HSPICE simulation of the same configuration (with the 1.8V battery). It appears that:

- the supply port of the TLM begins to ripple before the driver voltage launch,
- good behaviours of the input port of the receiver and the driver.

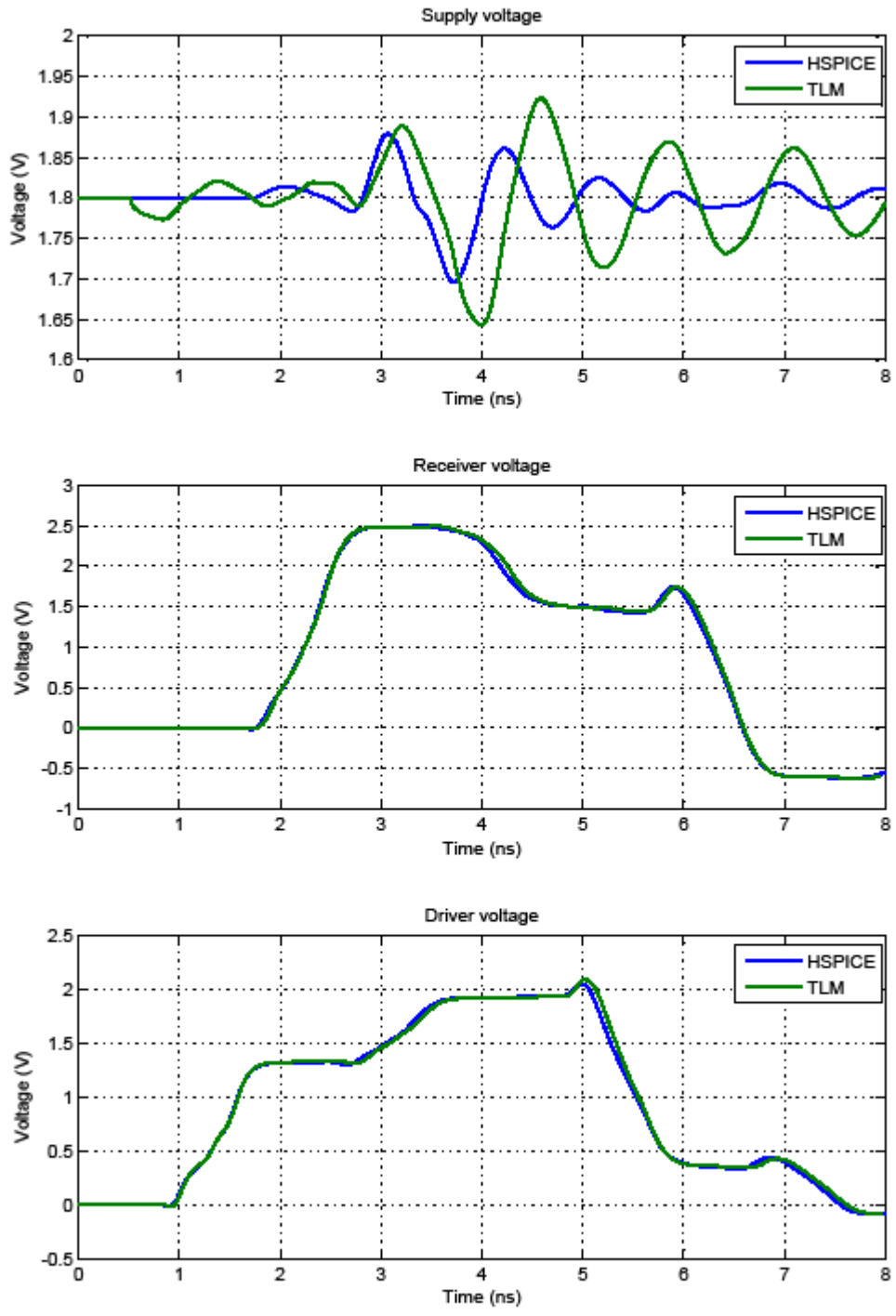


Figure 4: Comparison of the TLM and HSPICE voltages – Second test of TLM implementation

Fig. 5 shows a zoom of the first time steps of the TLM voltages. It appears that:

- the driver voltage should be null up to around 0.6ns. Nevertheless, some ripples are observed,
- the ripples of the driver voltage entailed the information propagation that is seen by the input port. This launches the solution search function and causes the ripple observed in the supply line.

III. CONCLUSION

- check the calculation for the driver,
- decrease the precision level in the various function (initially at 1.10^{-10}).

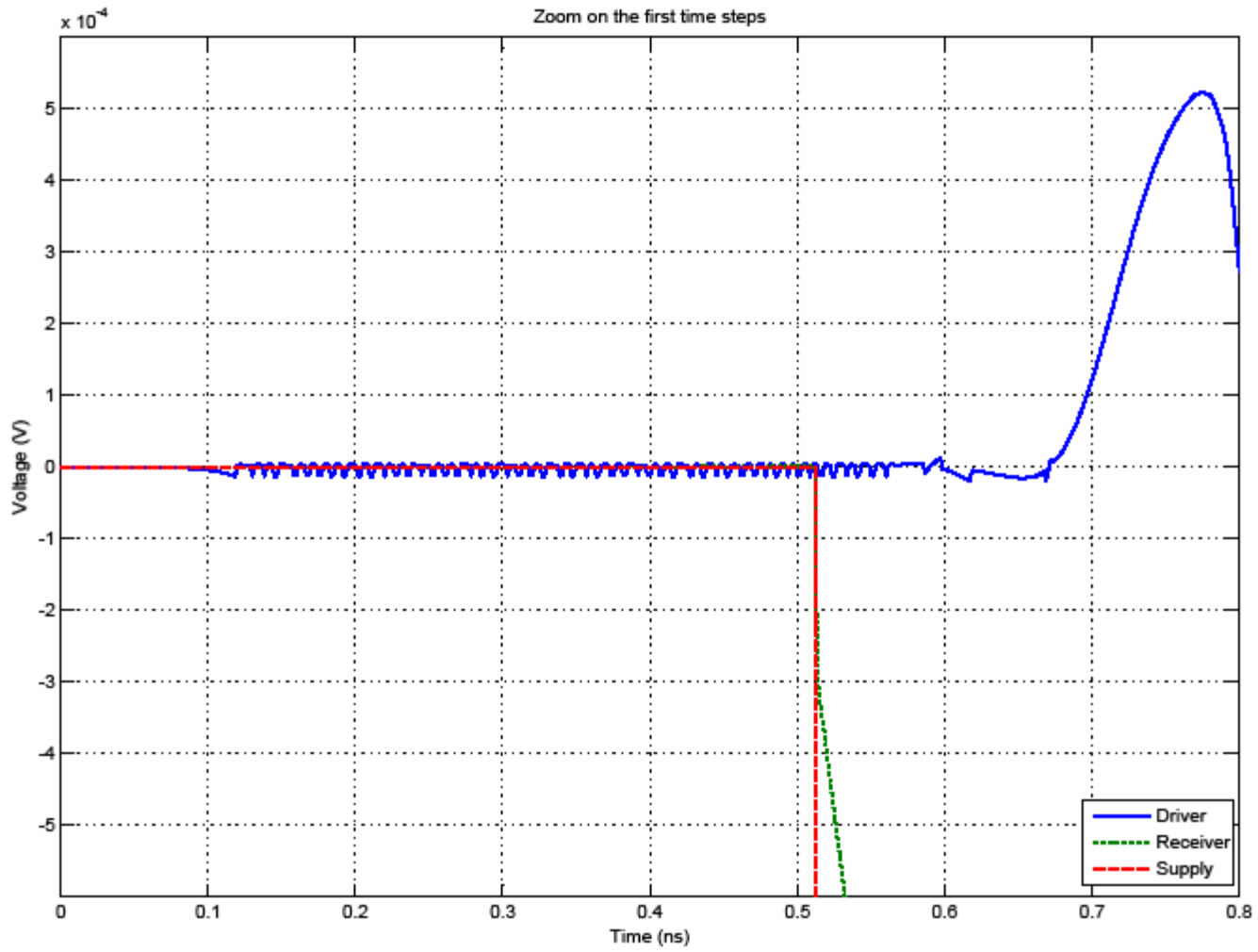


Figure 5: Zoom of the first TLM time steps