

Cables with Three Splices

The Hybrid Analysis Type gives possibility for analysis of cable systems on crosstalk, radiation and susceptibility problems.

Problem Definition

Aim of this application note is to show that XTalk can simulate crosstalk problems for complex configuration of cables with splices. Splice of cable harness is specific point where wires can be connected or merged.

Five cables of length 50cm and two cables of length 40cm are considered. Cables are connected through three splices. S-parameters are simulated and compared with measurements (see Fig.1).

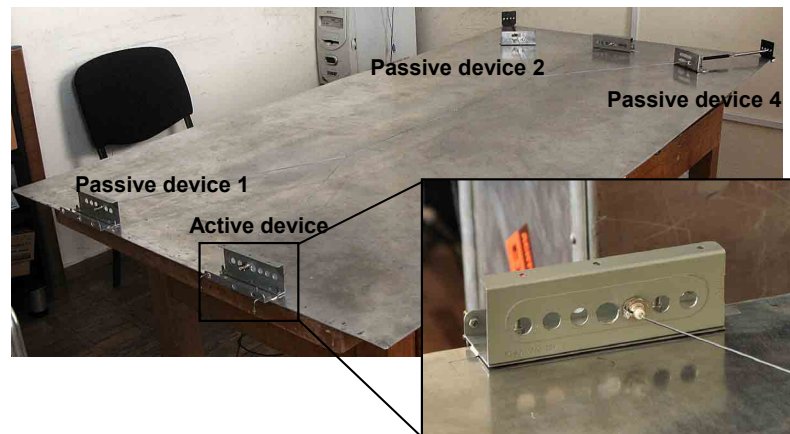


Fig. 1. Measurement setup

All cables are connected with ground by 50Ohm load.

Crosstalk between wires is measured in EMCoS measurement laboratory. Simulation model is shown in figure below.

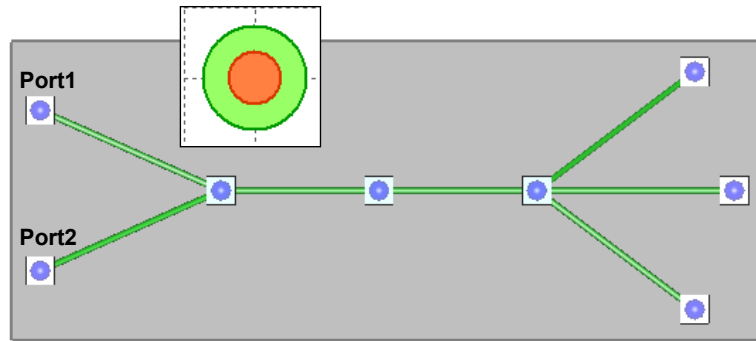


Fig. 2. Cables with three splices

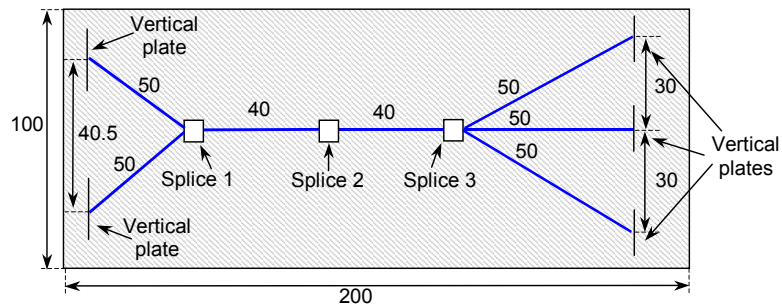


Fig. 3. Topology of problem

For modeling of BNC connectors in schematic transmission lines without losses are added in all devices for modeling of 2 cm long connectors.

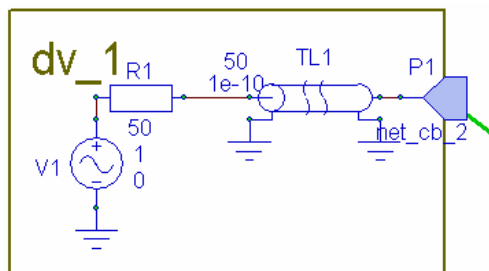


Fig. 4. Active device

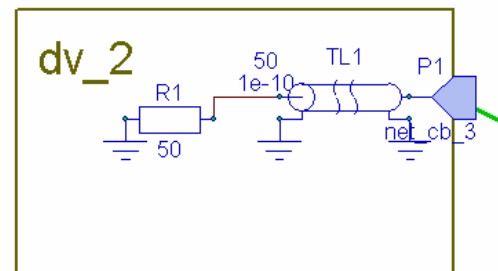


Fig. 5. Passive device

Numerical Results

Comparisons of measurement and simulation results are presented in the figures below.

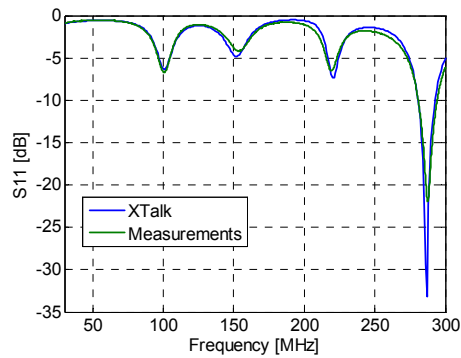


Fig. 6. S11 vs. frequency

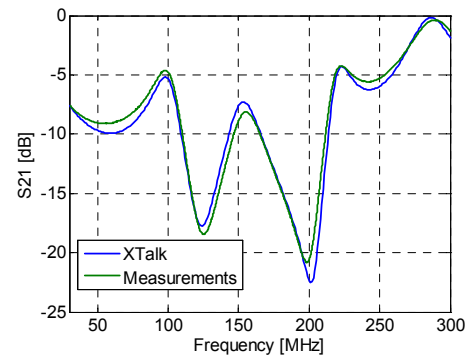


Fig. 7. S21 vs. frequency

Conclusions

Results of application example show that XTalk simulation results are in very good agreement with measurements.