Double Shield Effect

One of the solutions for minimization of crosstalk between cables is shielding technique. There are different types of cable shielding: solid, braided, double shielded. All this types of shields are supported within EMC Studio Cable Library. The shielding effects are investigated in current Application Note.

Many cable manufacturers operate with the same coaxial cable world standards. The most popular are cables from RG series. For investigation of Hybrid methods abilities to calculate coaxial cable radiation is considered RG-6/U coaxial cable with 75% copper braid.

Problem Definition

Aim of this application note is to demonstrate shielding effect of double braid coaxial cable in Hybrid Analysis Type calculation.

Fig. 1. RG-6/U Type coaxial cable with foil shield and 75% tinned copper braid

Calculations are performed for four models:

- Without shielding
- With braided shield
- With solid shield
- With both shield layers (double shielded)

Basic scheme of computational model is shown in the following picture.

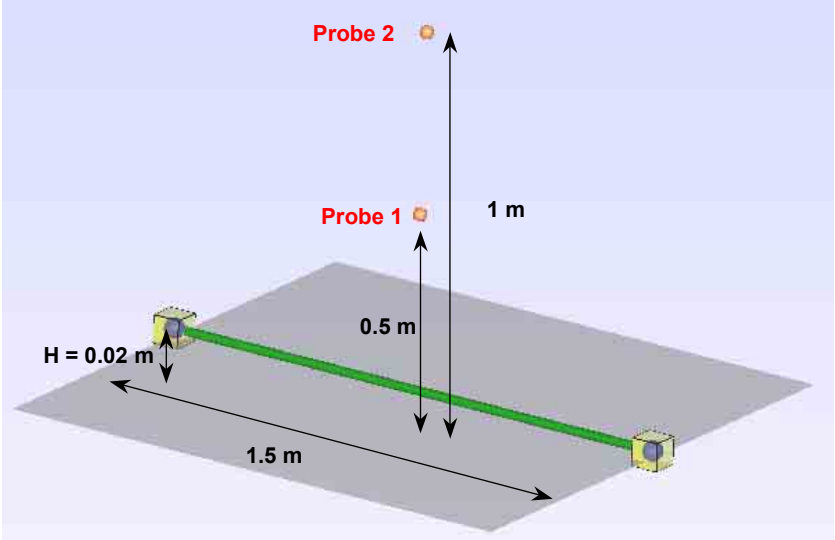

Fig. 2. General model view

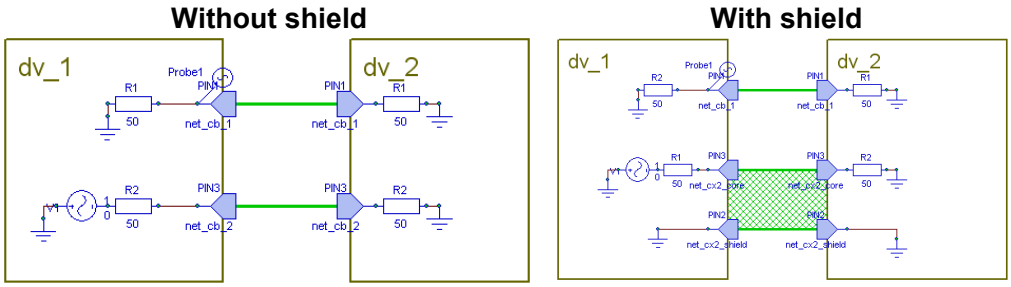

Fig. 3. Terminations scheme of the model with and without shield

Numerical Results

In this section are presented results for current coupled into single wire and field induced in filed probes.

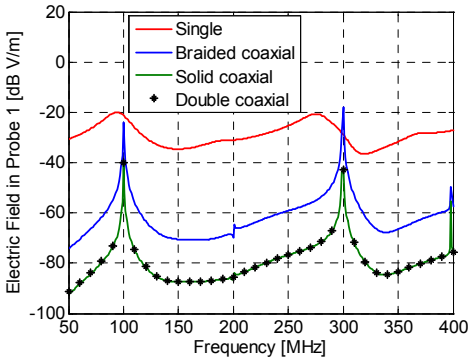

Fig. 4. Electric field in Probe 1

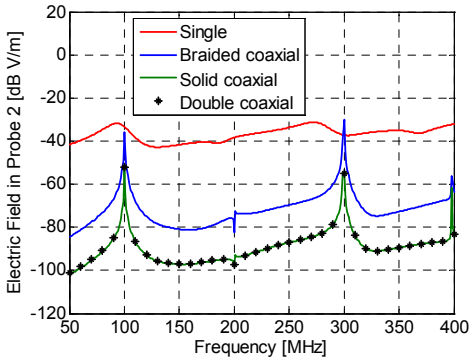

Fig. 5. Electric field in Probe 2

27 Pekin Str., Tbilisi, 0160, Georgia
Tel.: ++995-32-389091; Fax: ++995-32-389092
www.emcos.com

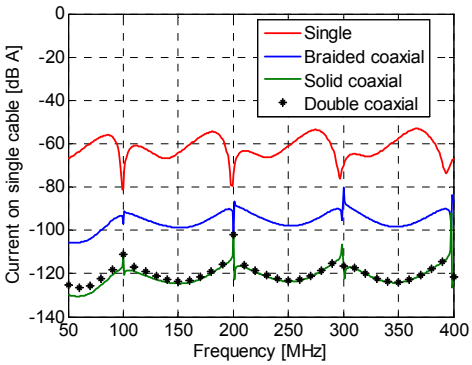

Fig. 6. Current coupled into single wire

From numerical results one can conclude that cable behavior is reasonable. Field penetrates more through braided shield and is almost the same in case of solid, double and PEC shields. There is almost no difference between last two cases because shielding effect of solid shield is very strong.

Conclusions

- The Hybrid Analysis Types supports different types of cable shielding
- The investigations of shielded effectiveness of cables can be performed within EMC Studio