

Channel Return Loss Modeling
Results – IEEE 802.3bq ad hoc
[Cable/Patch Cords Z_o (+/- 4.5 Ohms)]

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Cable asymptotic impedance: Zcbl Patch cord asymptotic impedance: Zcrd

$$Z_{O_k} := \left(1 + 0.055 \cdot \frac{1-j}{\sqrt{f_k}} \right) \quad \boxed{Z_{cbl} := 104.5} \quad \boxed{Z_{crd} := 95.5} \quad z_{cbl_k} := Z_{cbl} \cdot Z_{O_k} \quad z_{crd_k} := Z_{crd} \cdot Z_{O_k}$$

$$z_{cbl_1} = 110.247 - 5.747i \quad |z_{cbl_1}| = 110.397 \quad z_{cbl_{250}} = 104.864 - 0.364i \quad |z_{cbl_{250}}| = 104.864$$

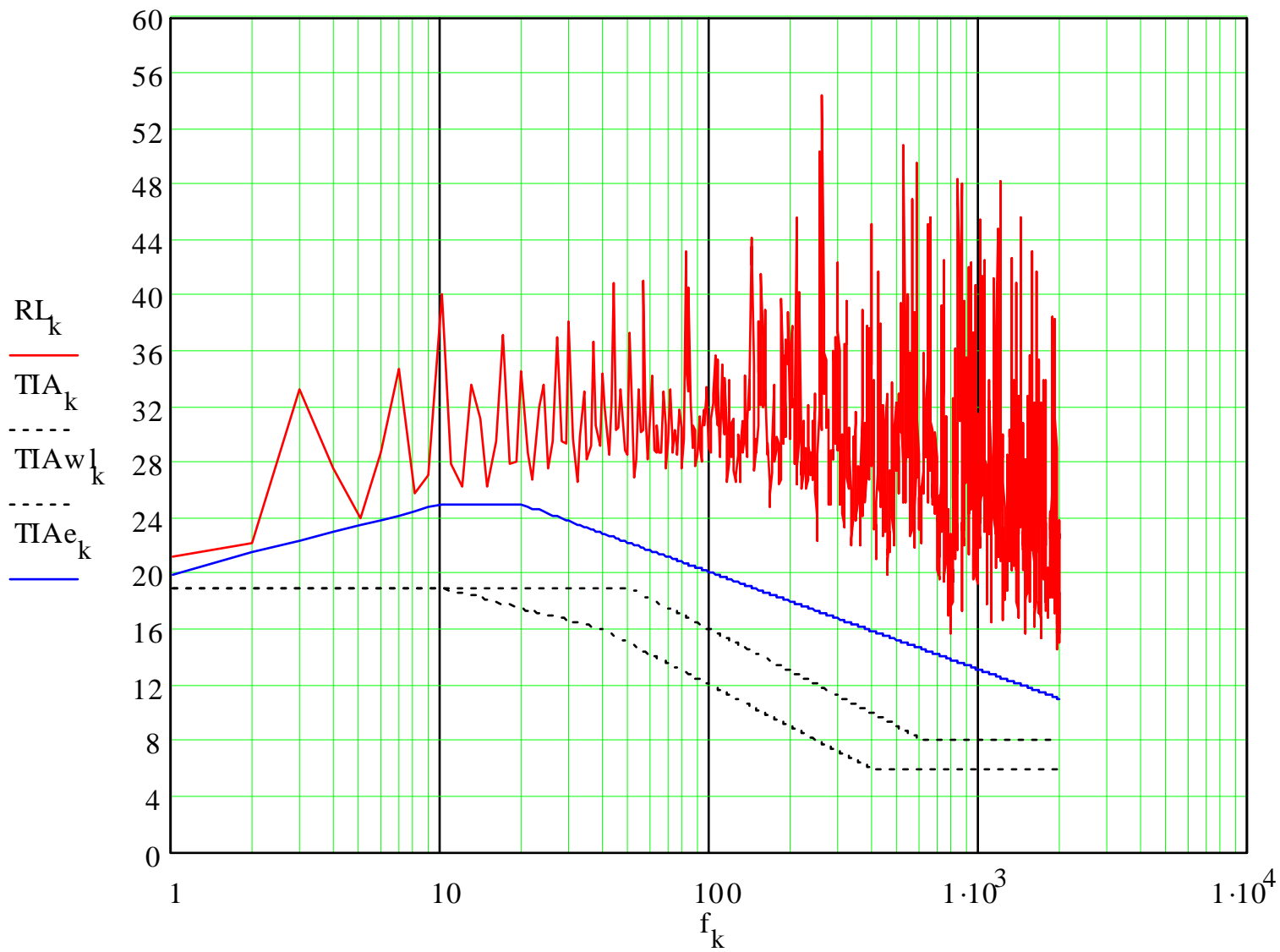
Cable transmission line constants $f_{100} = 100$ $f_{250} = 250$ $f_{500} = 500$

$$V_{p_k} := \frac{100}{\left(494 + \frac{36}{f_k} \right) \cdot 10^{-9}} \quad \frac{V_{p_1}}{c} = 0.629 \quad \frac{V_{p_{100}}}{c} = 0.674 \quad \frac{V_{p_{250}}}{c} = 0.675 \quad \frac{V_{p_{500}}}{c} = 0.675$$

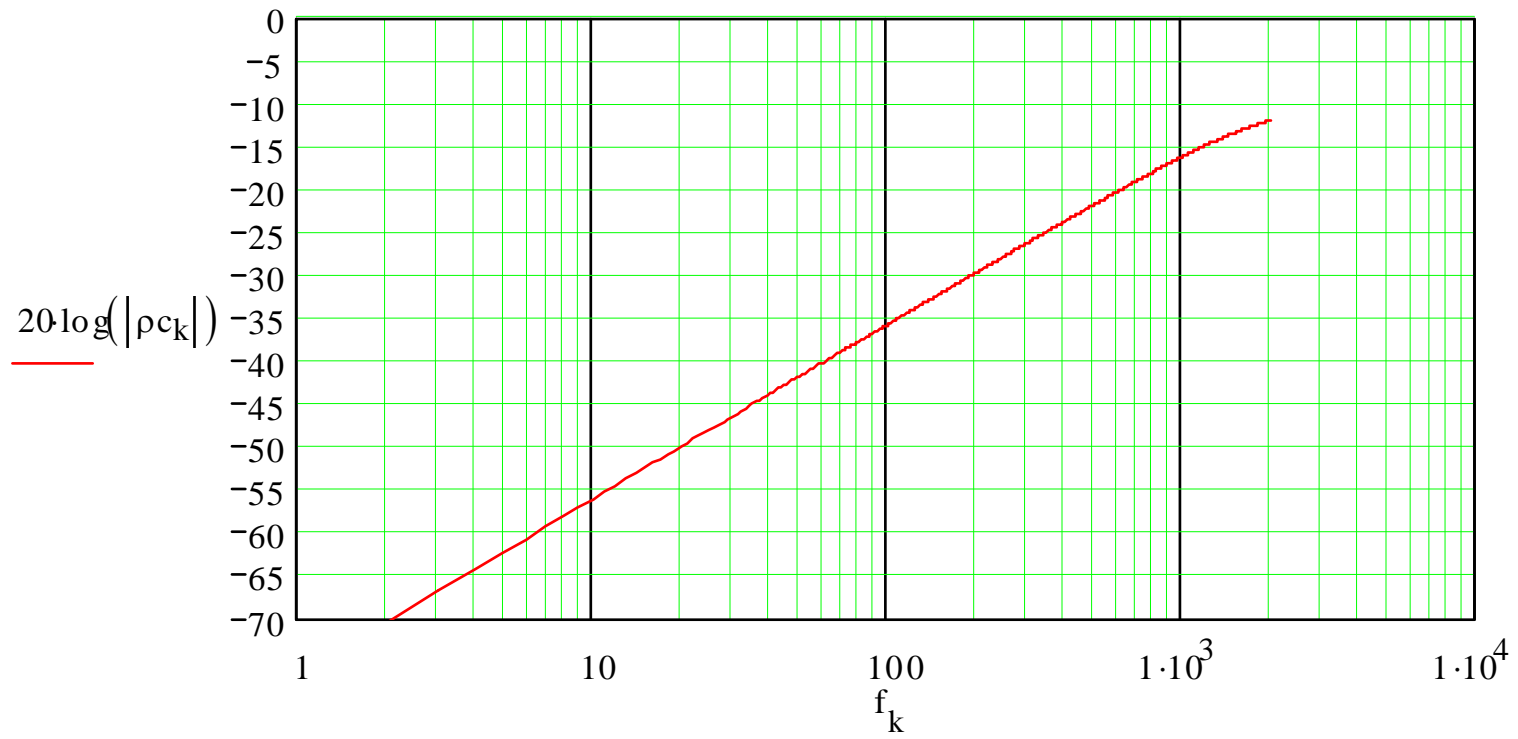
$$Att_k := \frac{\left(1.80 \cdot \sqrt{f_k} + 0.005 \cdot f_k + \frac{0.25}{\sqrt{f_k}} \right)}{1} \quad Att_{100} = 18.525 \quad Att_{250} = 29.726 \quad Att_{500} = 42.76$$

$$\alpha_k := \frac{\frac{Att_k}{100}}{20 \cdot \log(e)} \quad \beta_k := \frac{2 \cdot \pi \cdot f_k \cdot 10^6}{V_{p_k}} \quad \gamma_k := \alpha_k + j \cdot \beta_k$$

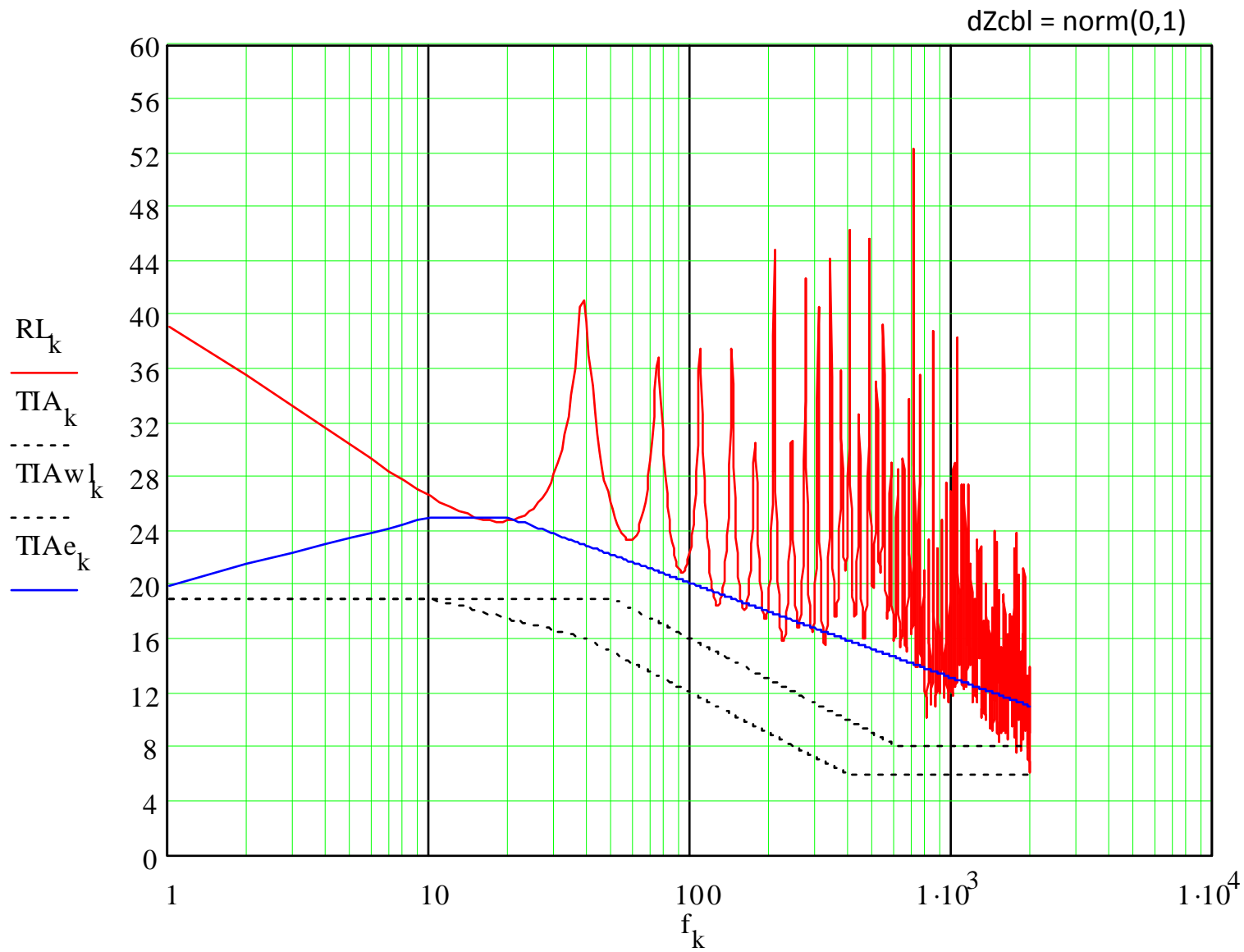
Cable Return Loss 30 m, $Z_{cbl} = 104.5$, $dZ_{cbl} = \text{norm}(0,1)$



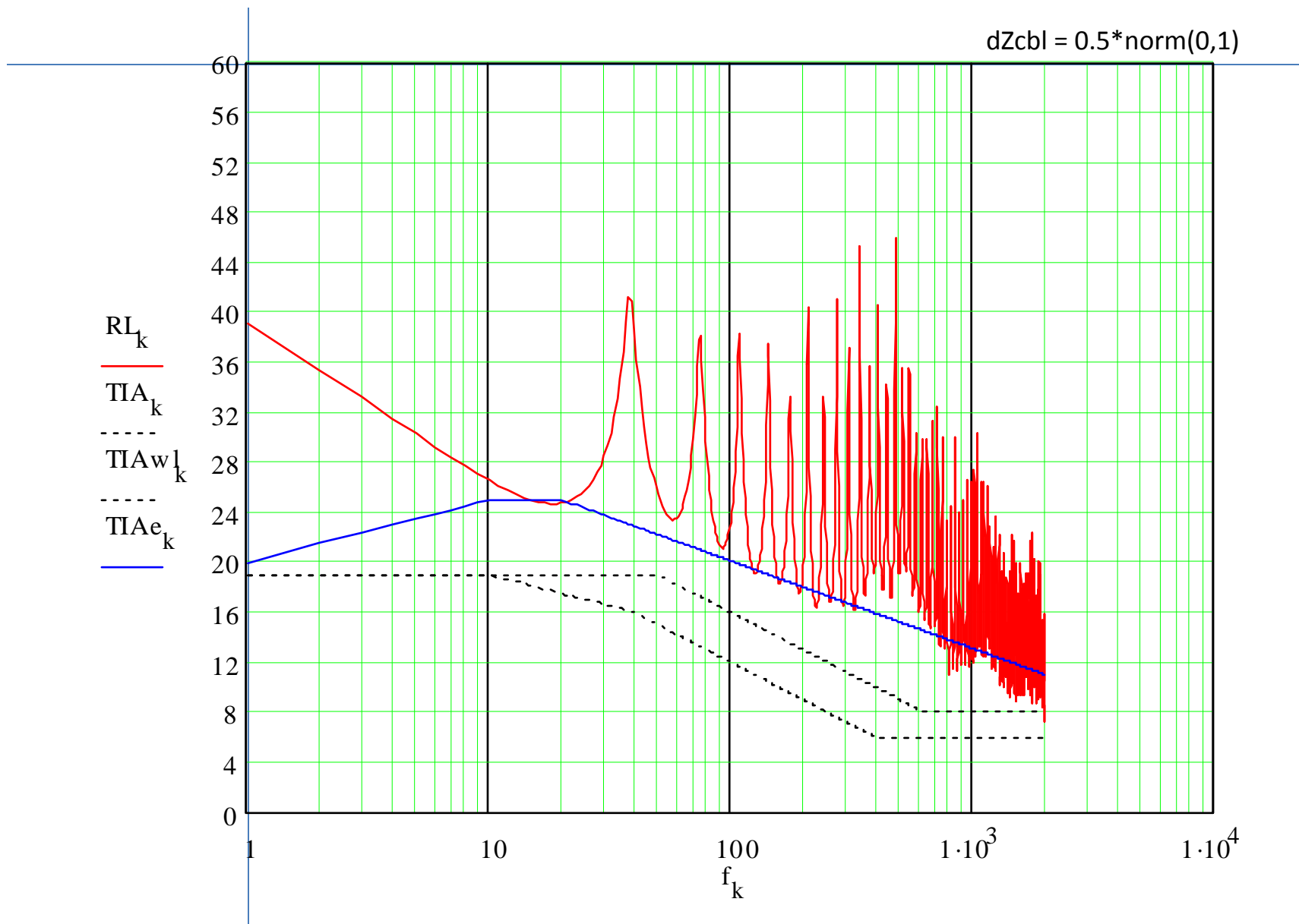
Connector Return Loss



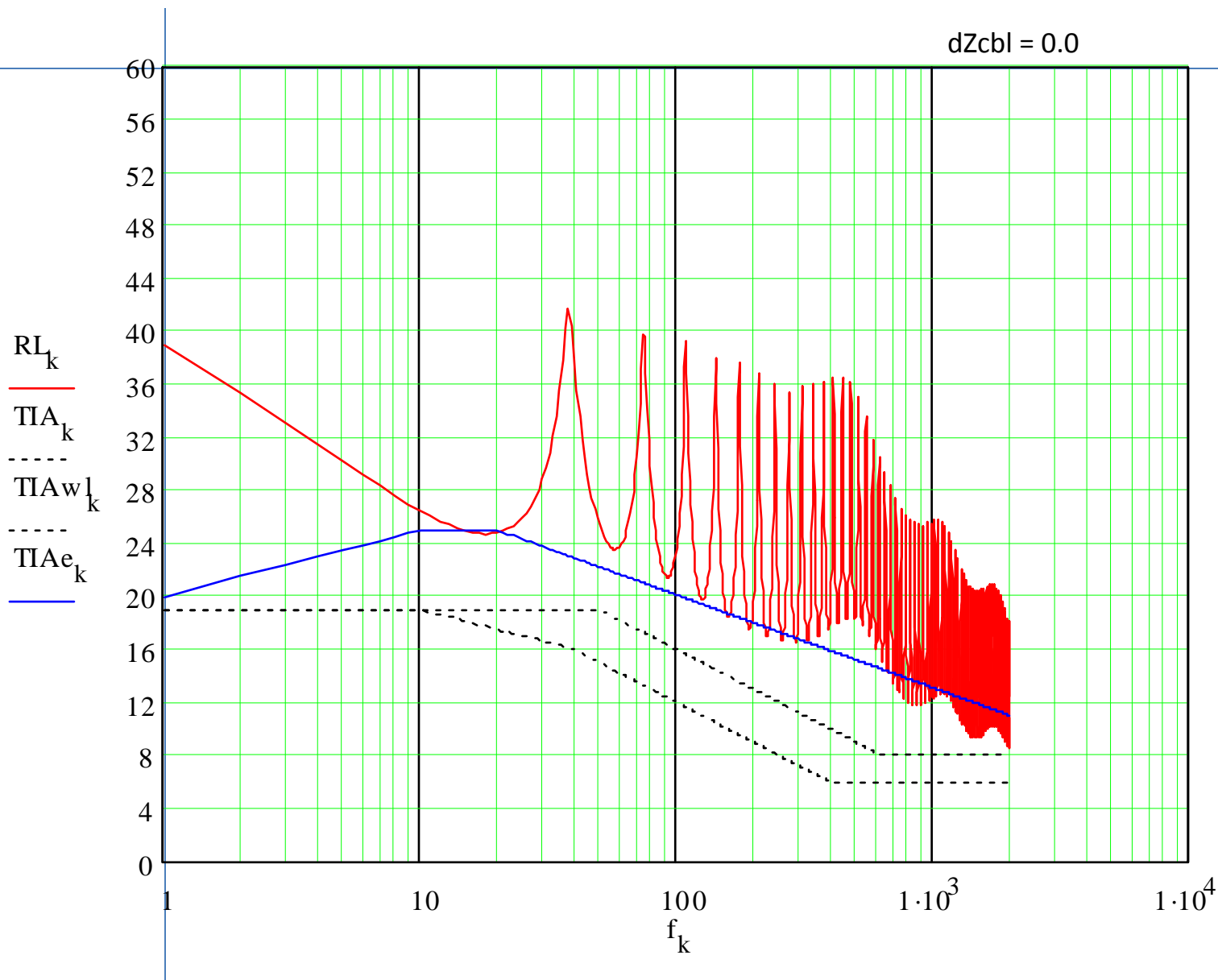
Really Short Chanel Return Loss (150mm-3m-150mm)



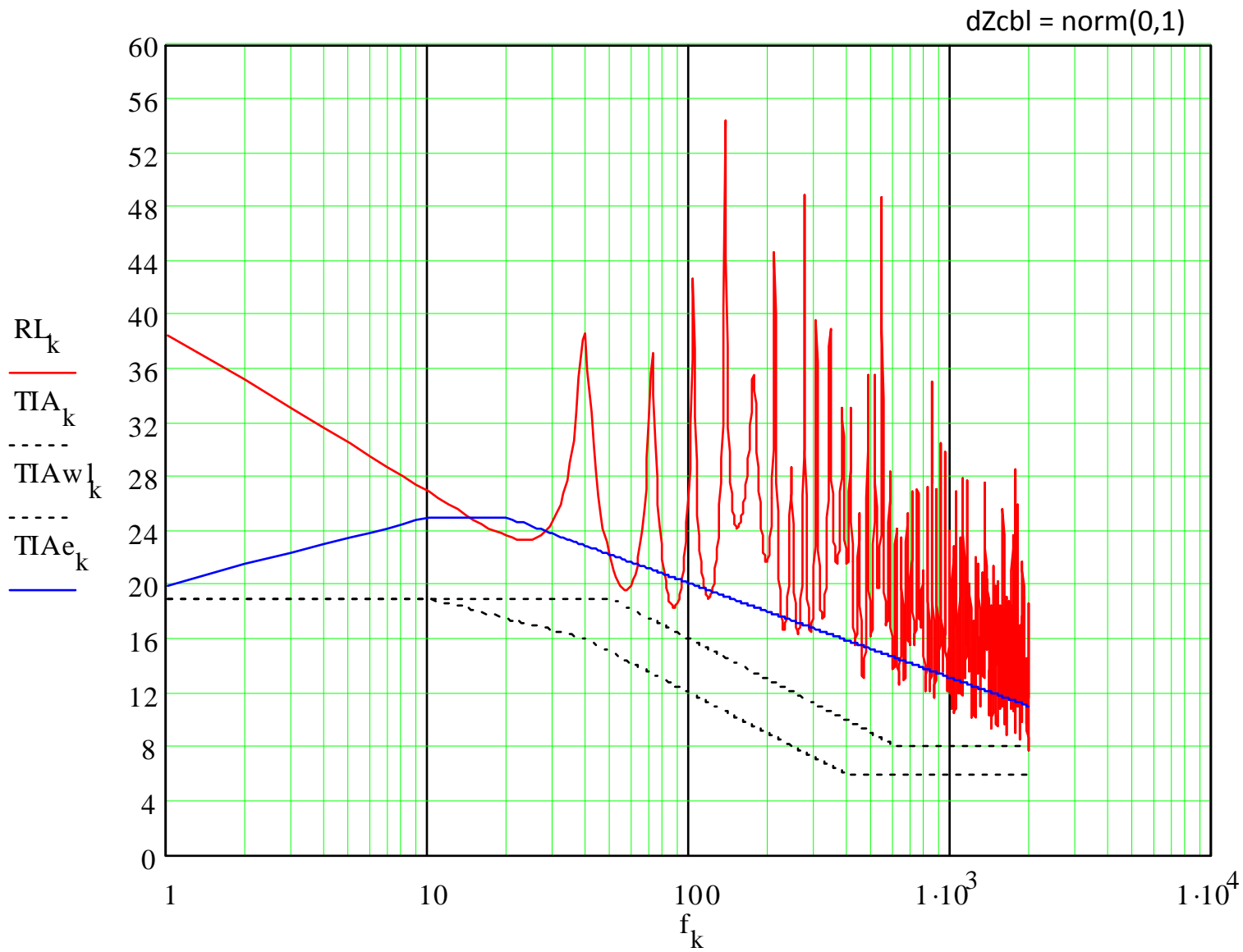
Really Short Chanel Return Loss (150mm-3m-150mm)



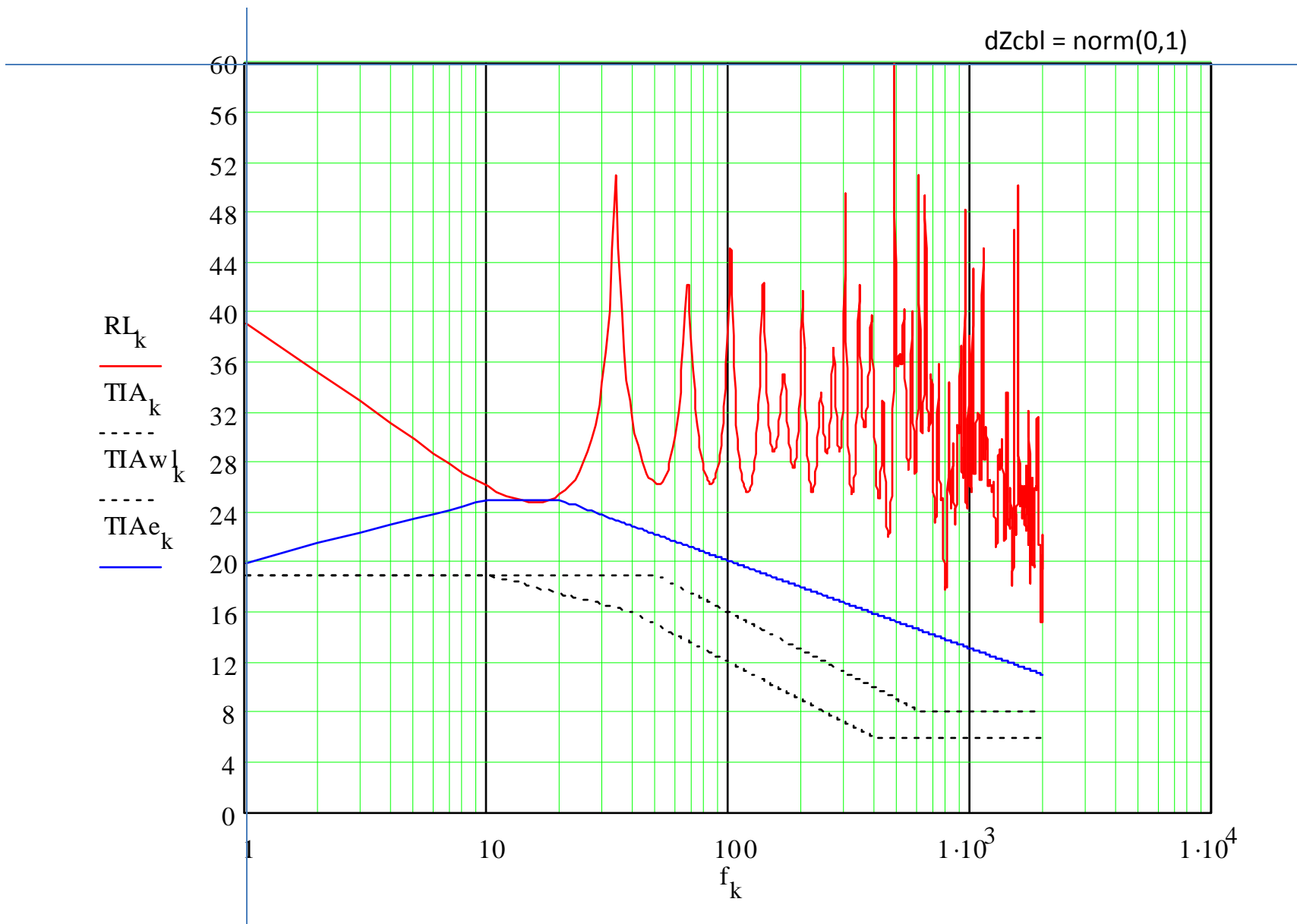
Really Short Chanel Return Loss (150mm-3m-150mm)



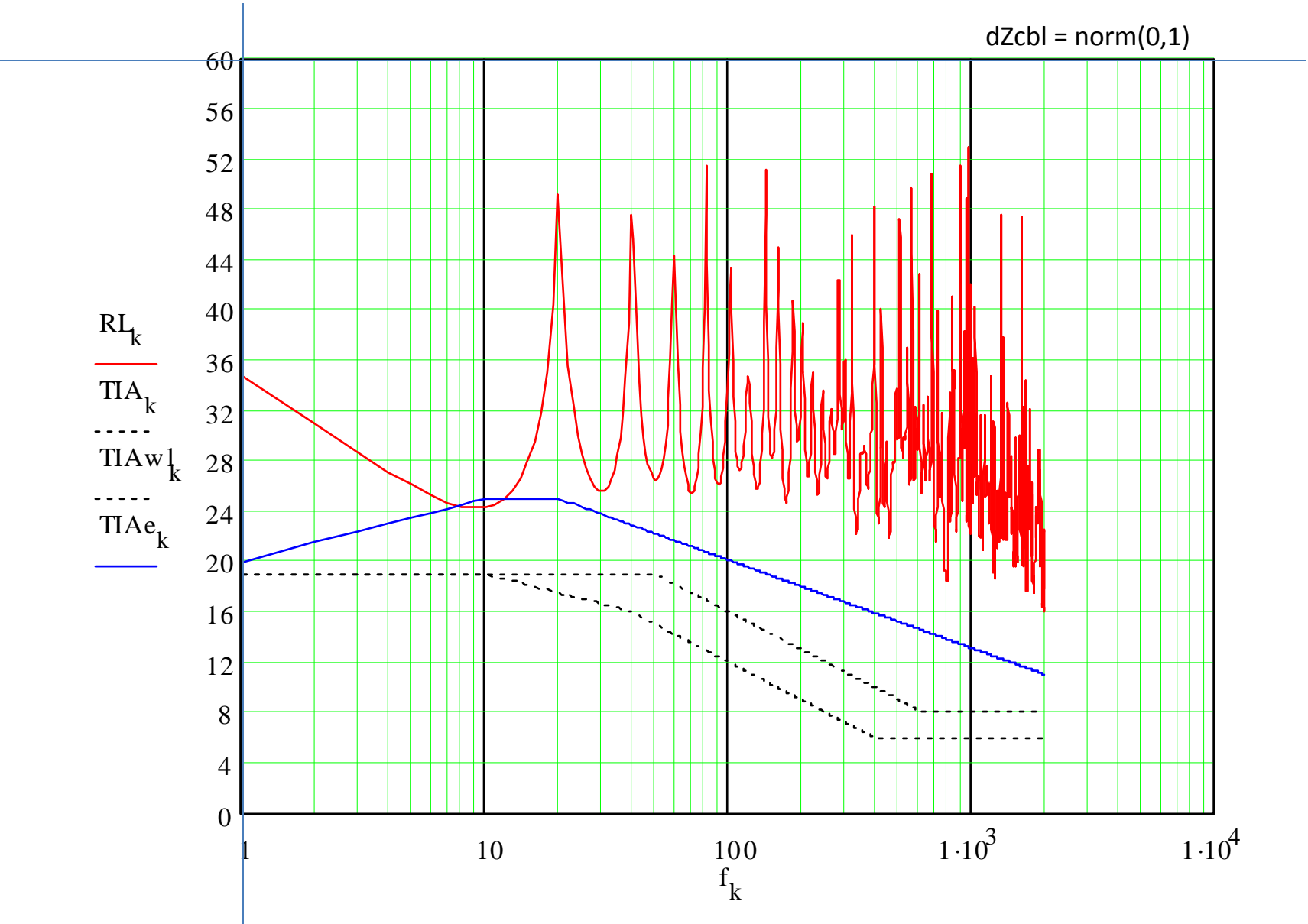
Pretty Short Chanel Return Loss (0.5m-3m-0.5m)



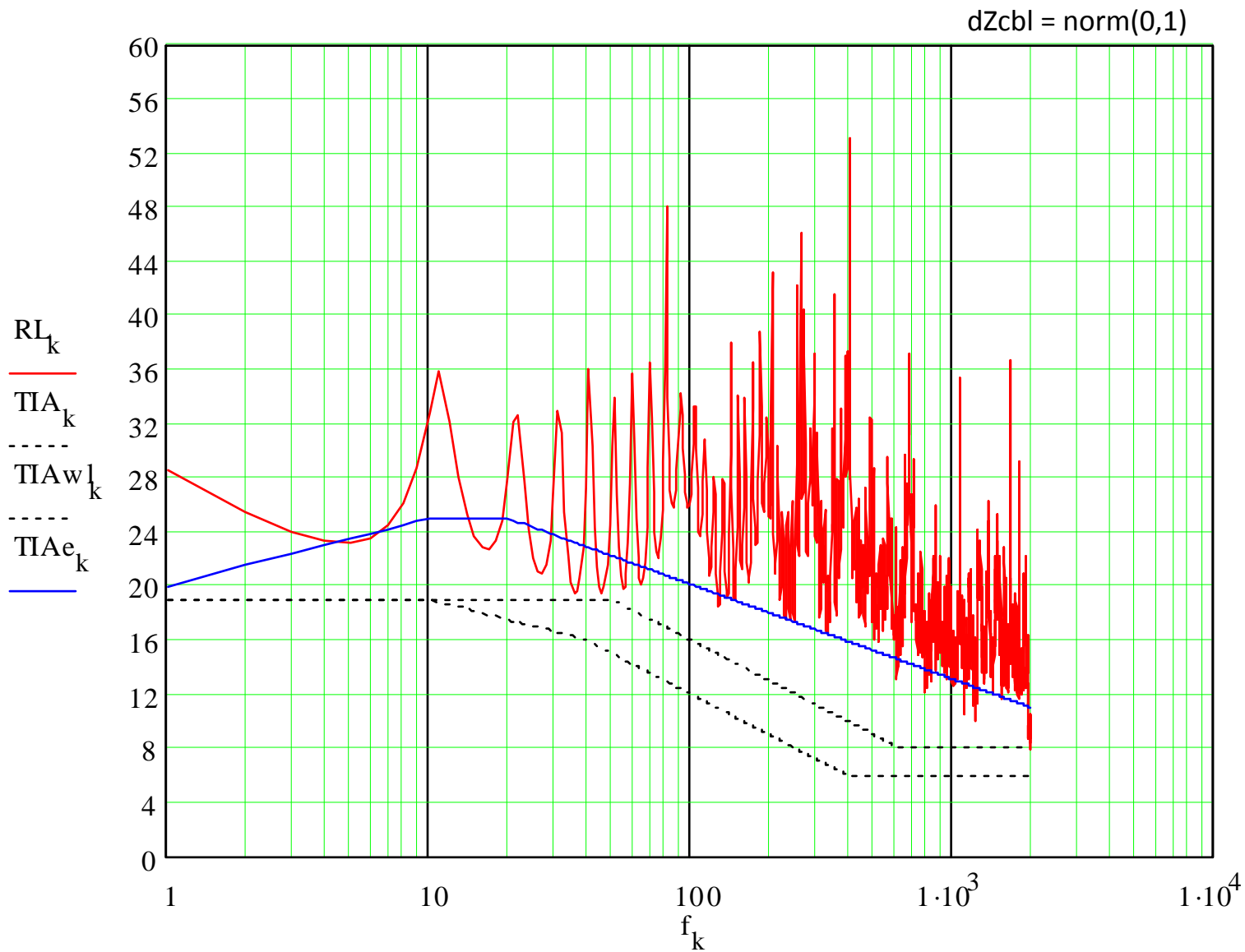
Endpoint to ToR Chanel Return Loss (3m)



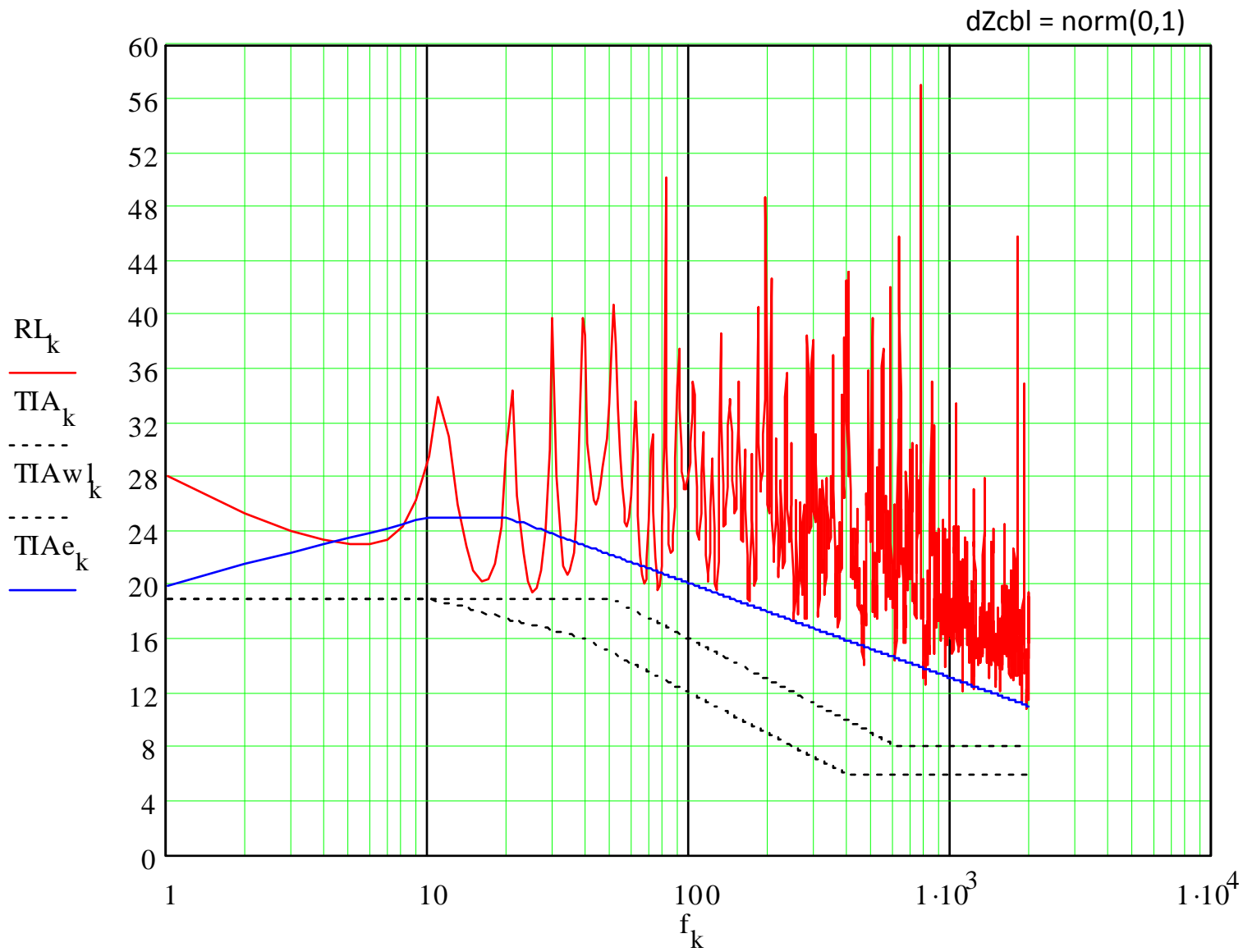
ToR to Adjacent Chanel Return Loss (5m)



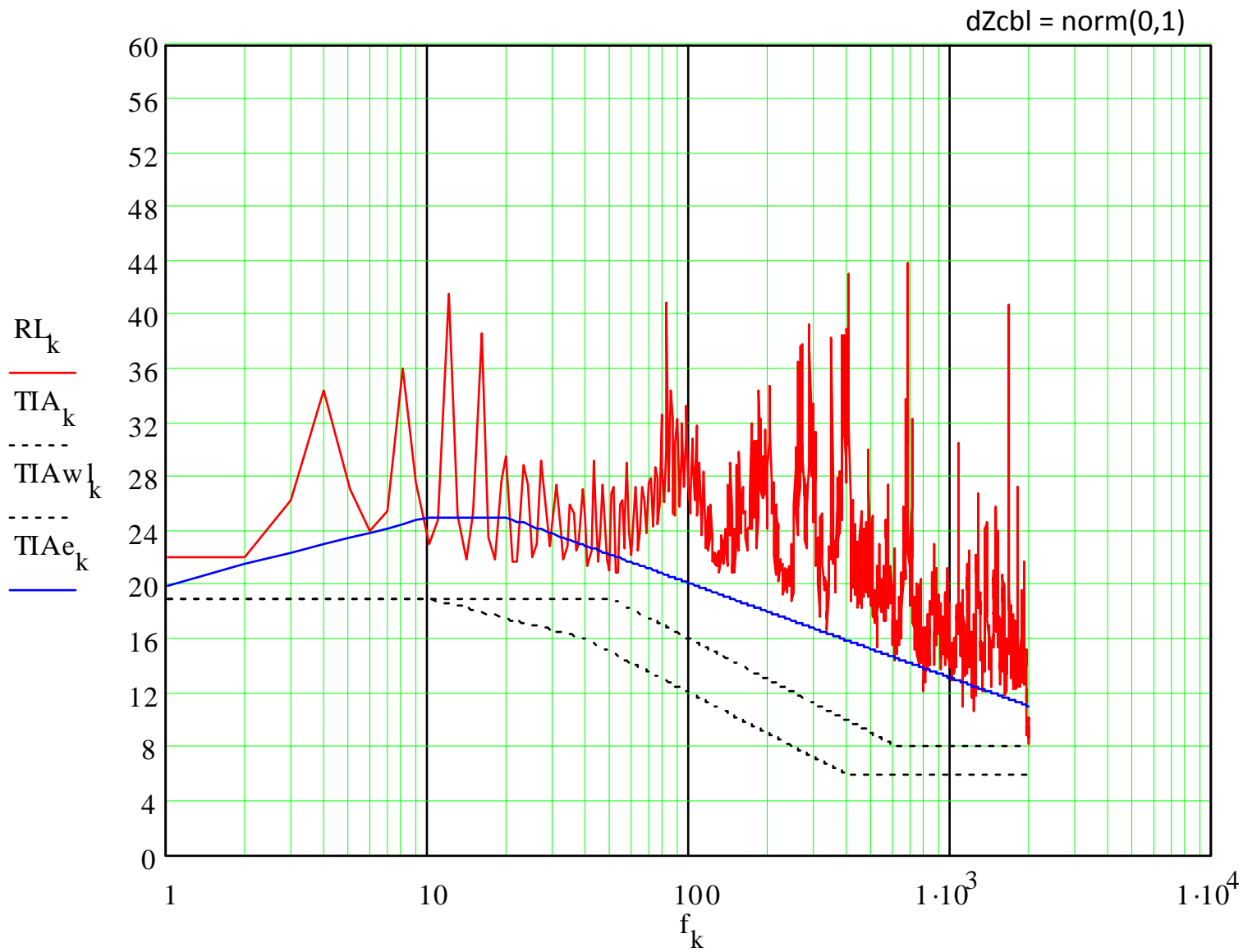
Chanel Return Loss (1m-10m-1m) ISO short reference channel



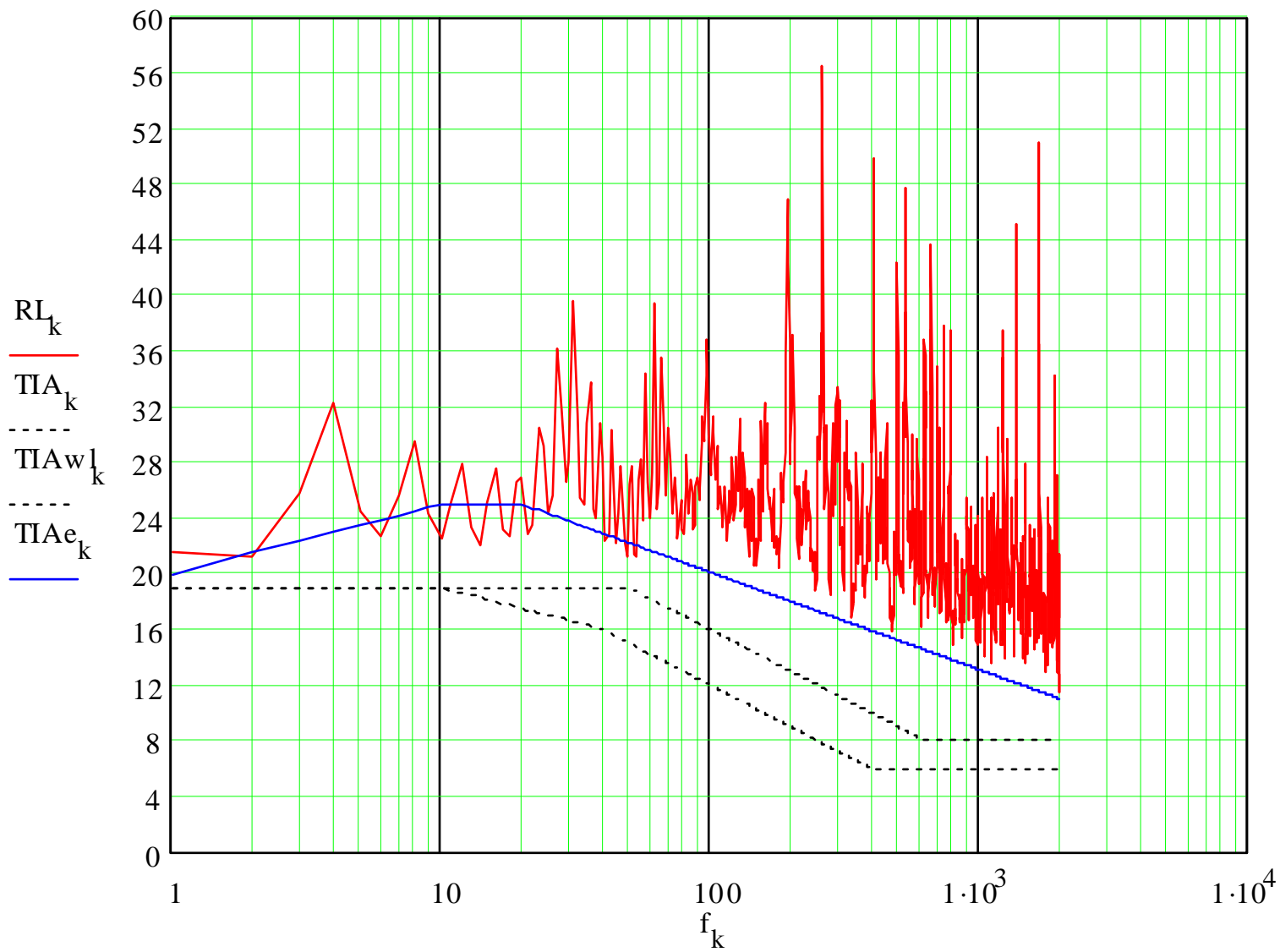
Chanel Return Loss (2m-10m-2m) ISO short reference channel



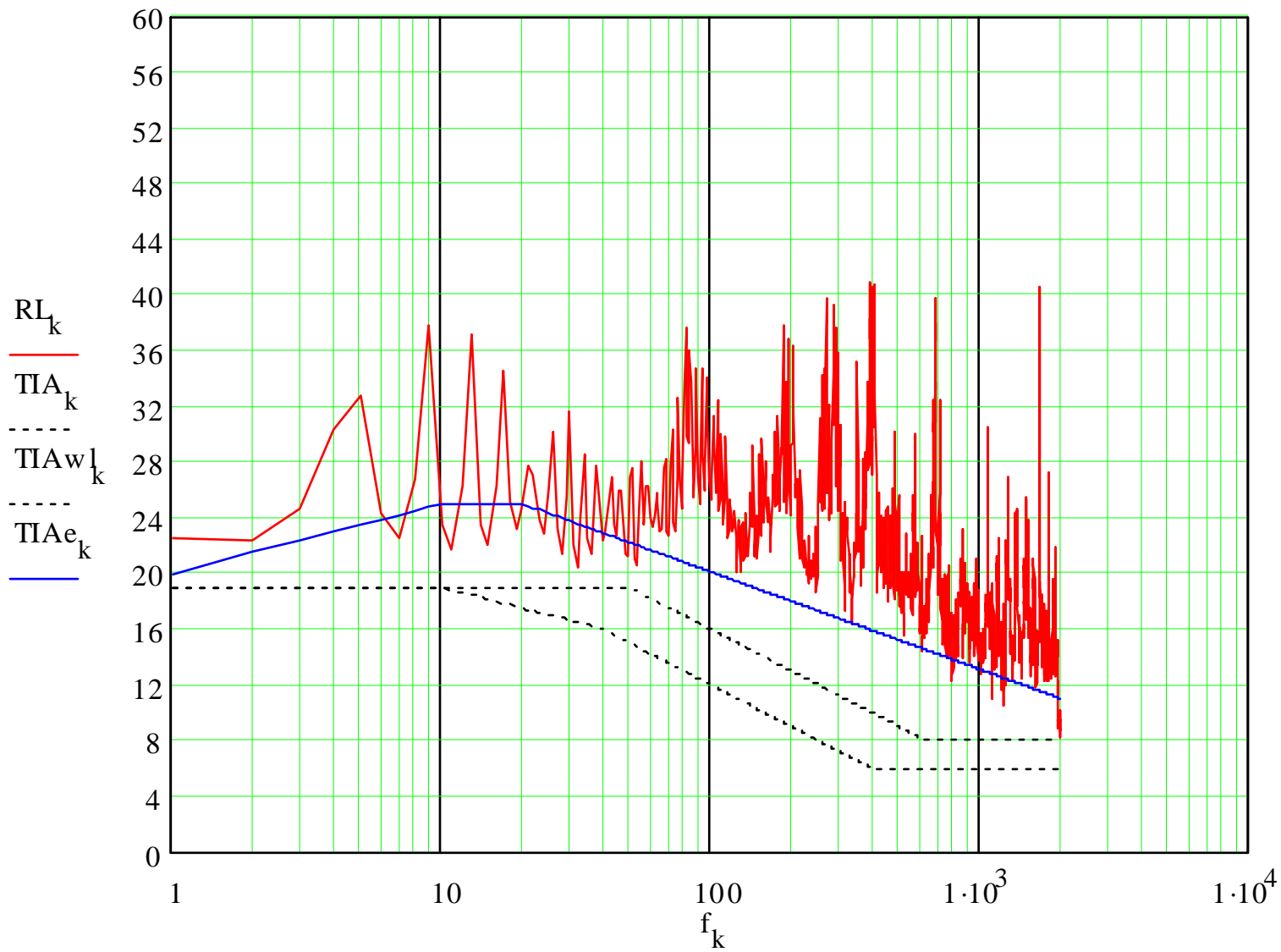
Chanel Return Loss 30m asymmetric #1 (1m-26m-3m) – Data center configuration #1



Chanel Return Loss 30m asymmetric #1 (3m-26m-1m) – Data center configuration #1



Chanel Return Loss 30m asymmetric #3 (1m-24m-5m) – Data center configuration #2



Chanel Return Loss 30m asymmetric #3 (5m-24m-1m) – Data center configuration #2

