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# ATCA Channel Crosstalk Worst Cases Analysis on Equalization Performance

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- **Objective:**

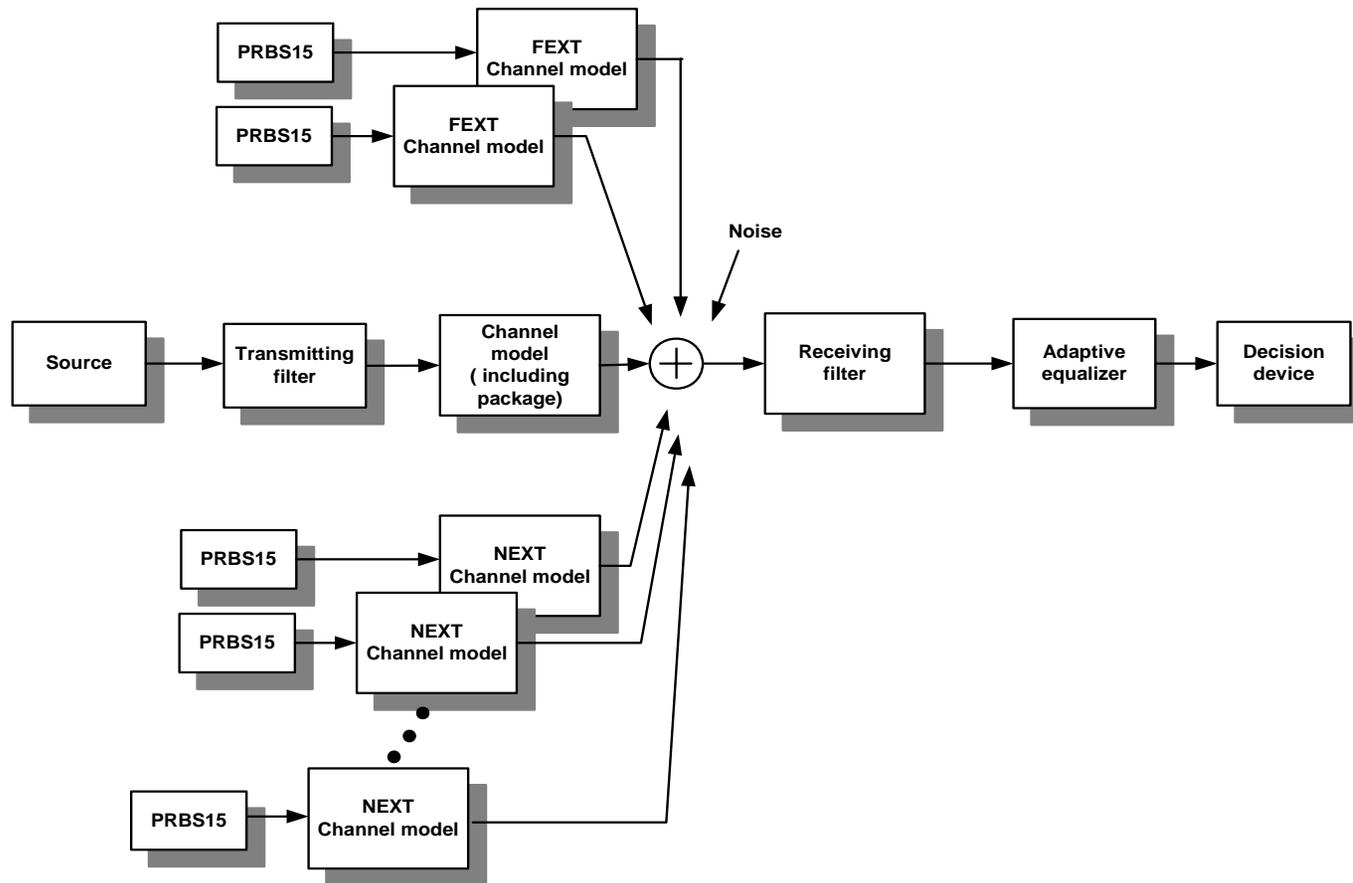
**Compare the crosstalk impacts on equalization performance and identify worst aggressors**

## Simulation configuration

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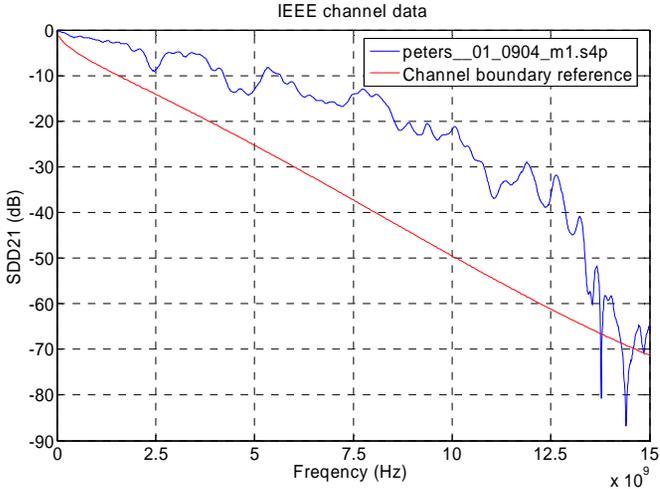
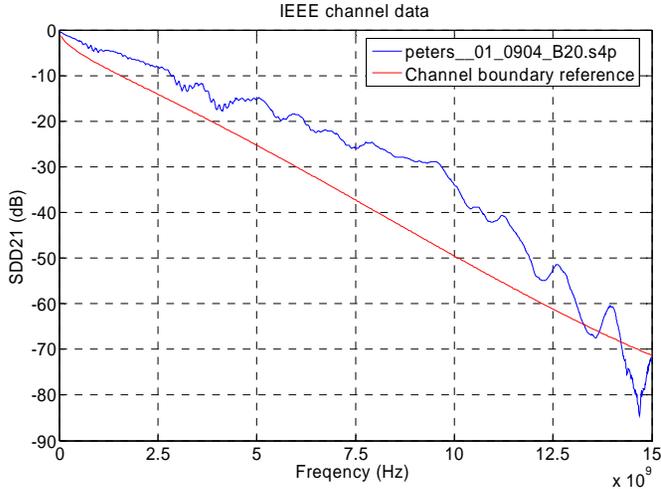
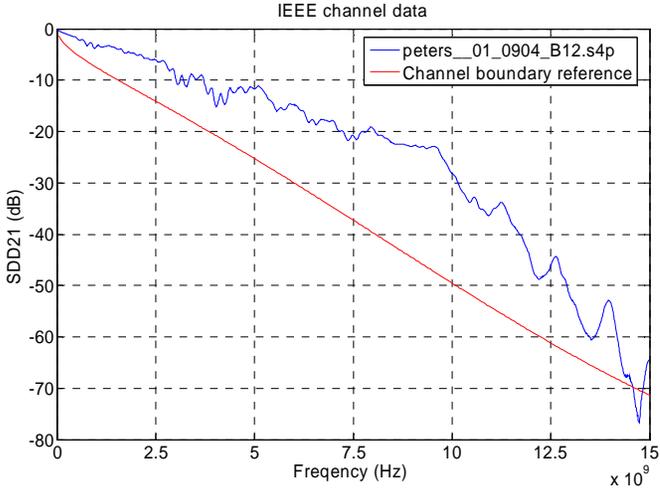
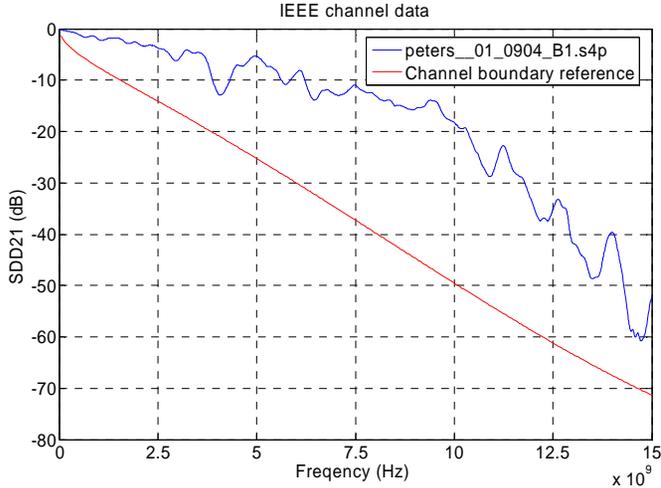
<b>Simulator setup</b>	<b>NRZ FFE3/DFE5</b>
<b>Tx amplitude</b>	<b>800 mVpp</b>
<b>Jitter</b>	<b>0</b>
<b>DCD</b>	<b>0</b>
<b>Random noise</b>	<b>1.46mVrms</b>
<b>Crosstalk</b>	<b>NEXT</b>
<b>Data pattern</b>	<b>PRBS15</b>
<b>Coupling</b>	<b>DC coupling</b>
<b>Package</b>	<b>Cap-like package model</b>
<b>Data rate</b>	<b>10.3 Gbps</b>
<b>Simulation time</b>	<b>32K bits</b>

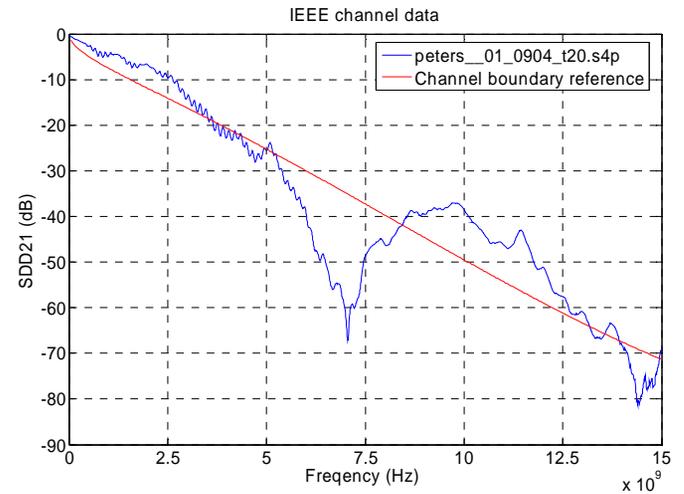
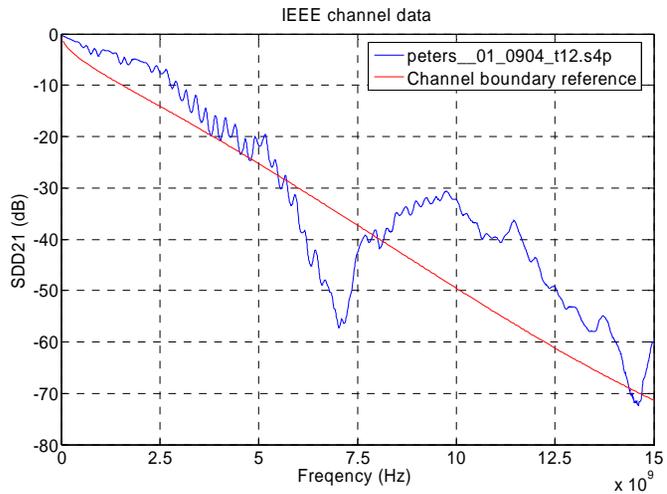
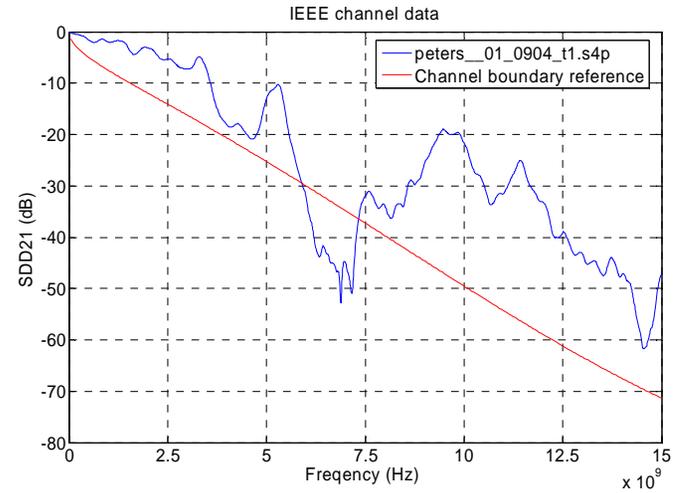
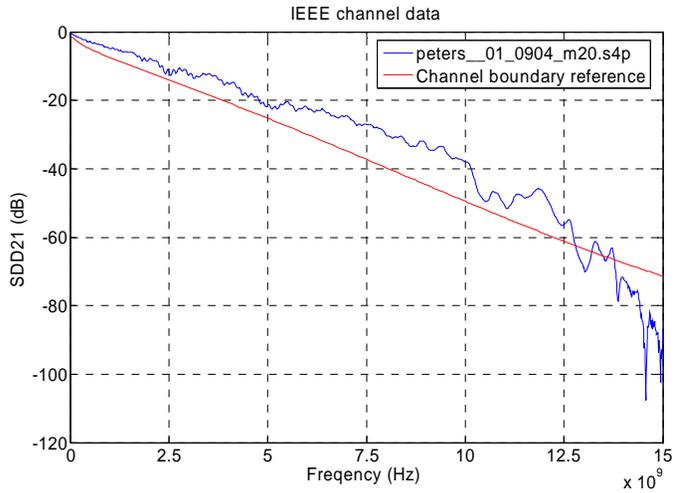
# Simulation methodology



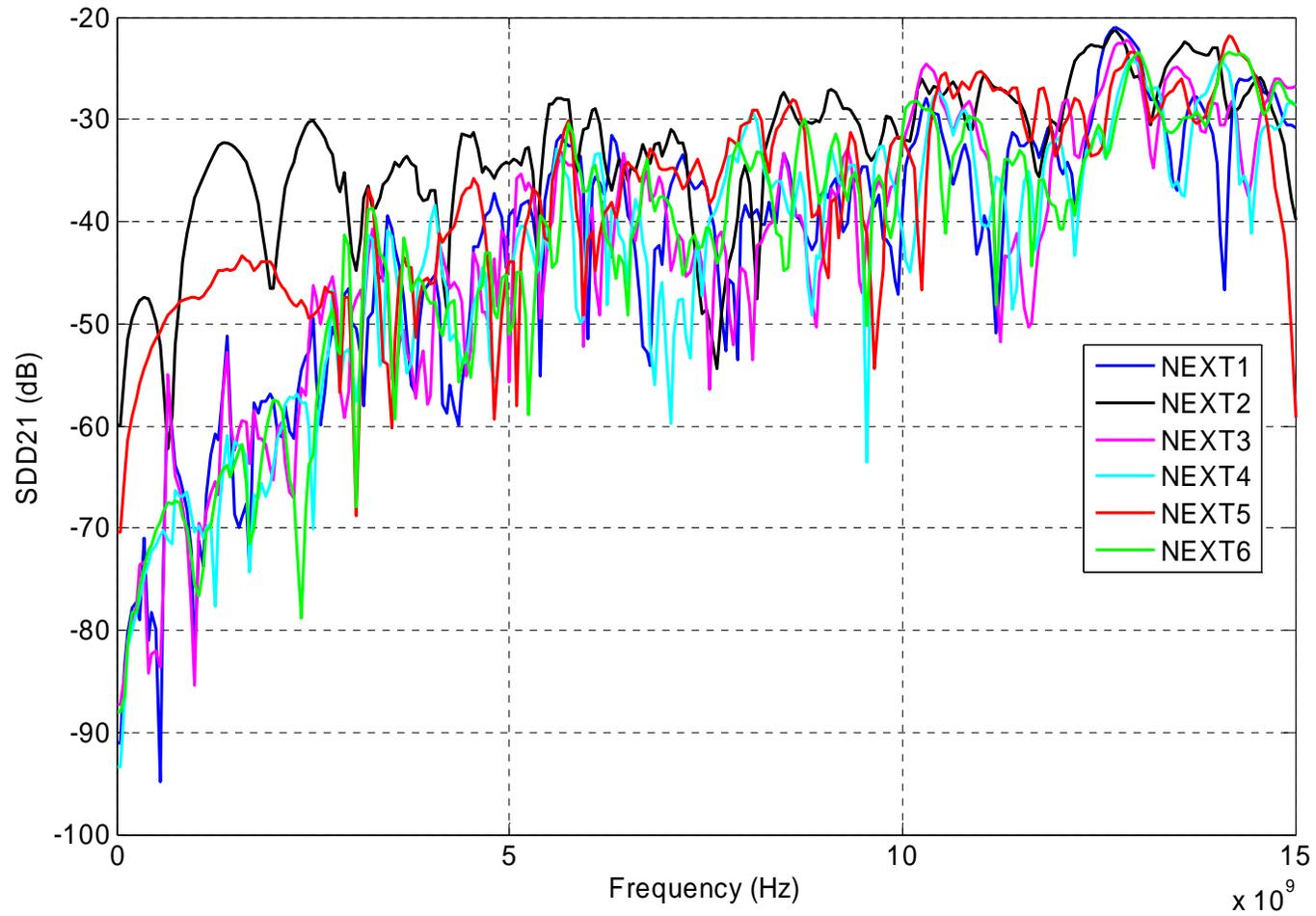
Simulation flow

# Intel ATCA channel models (original measurement data)

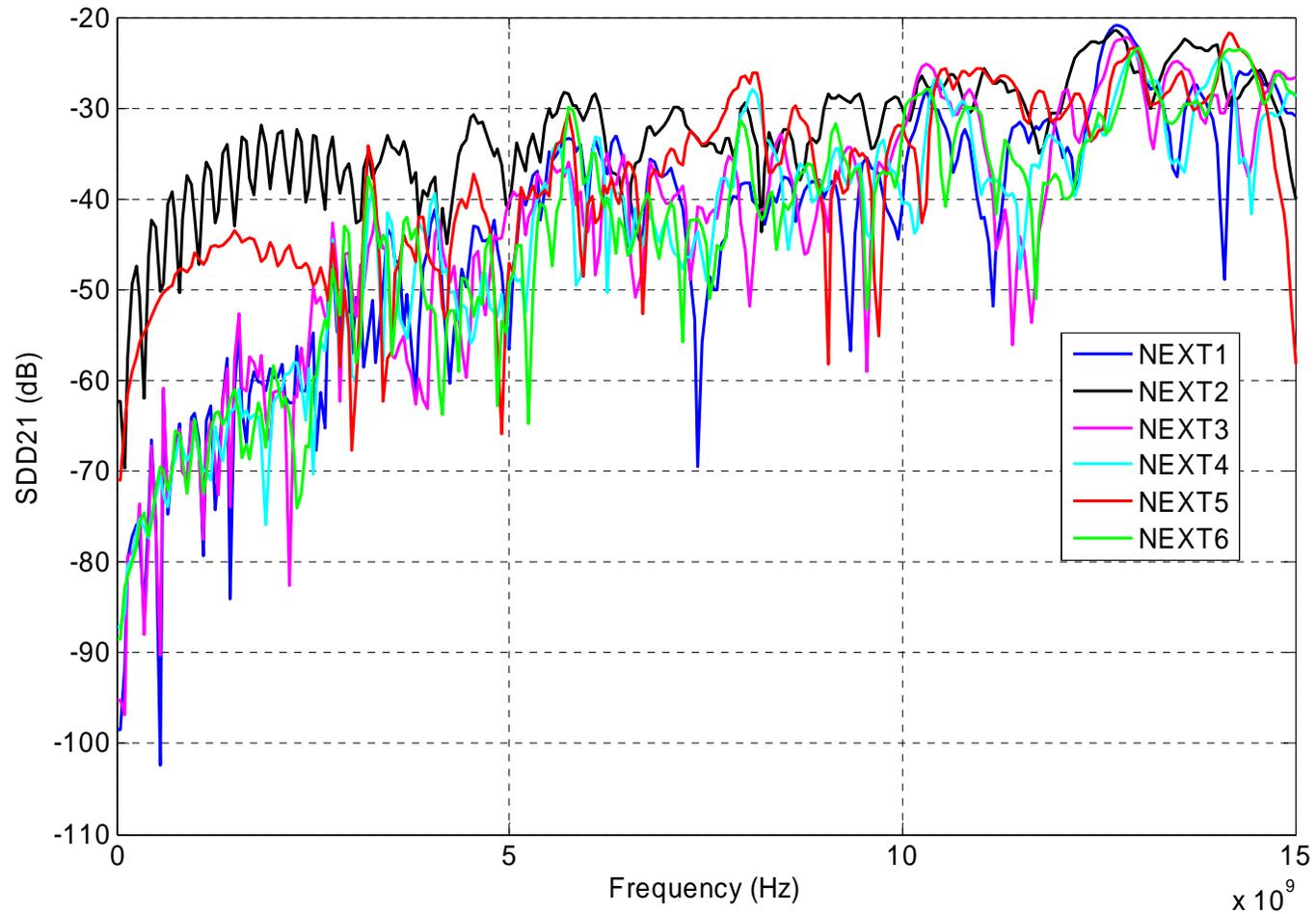




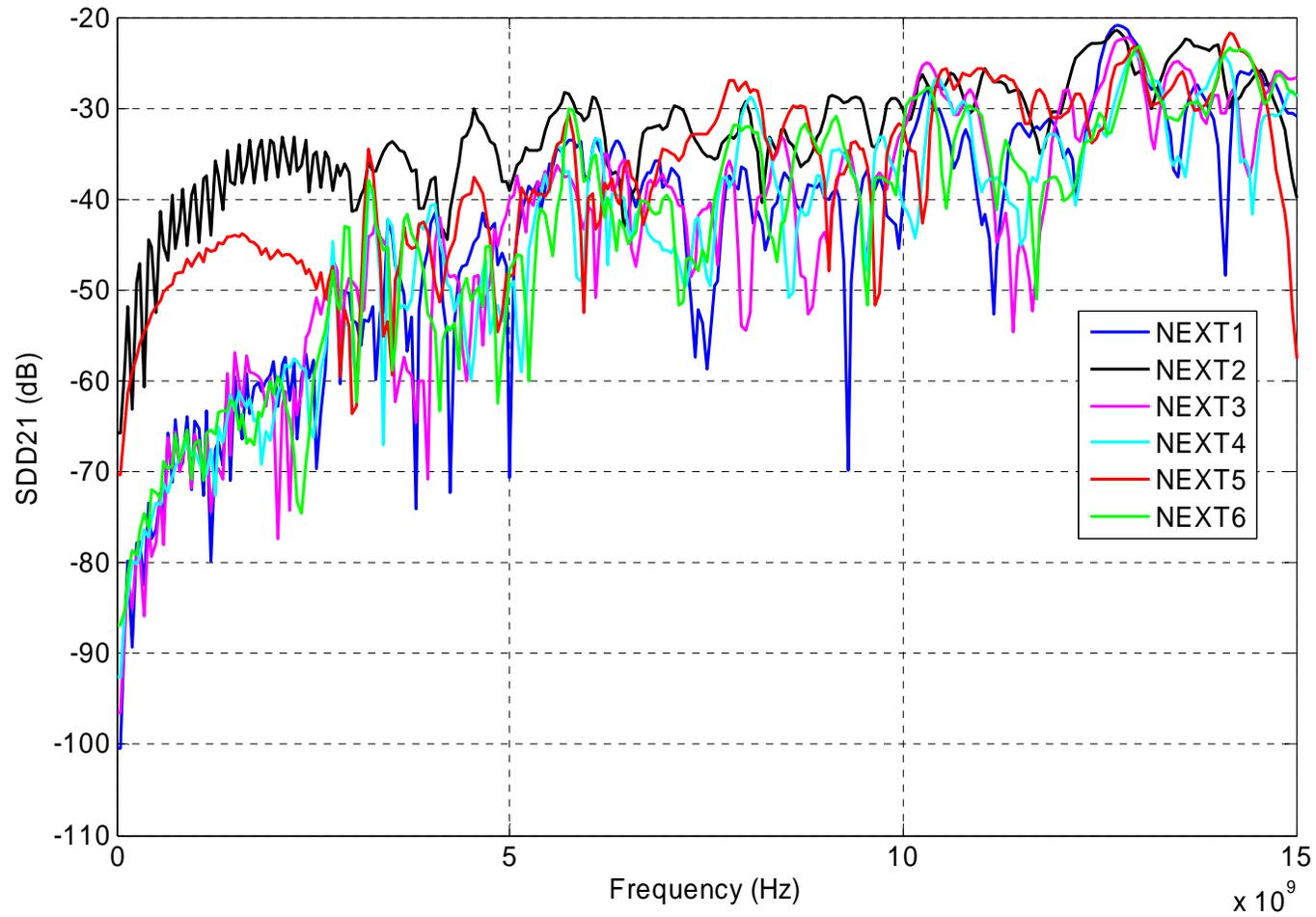
## B1 channel NEXT aggressors



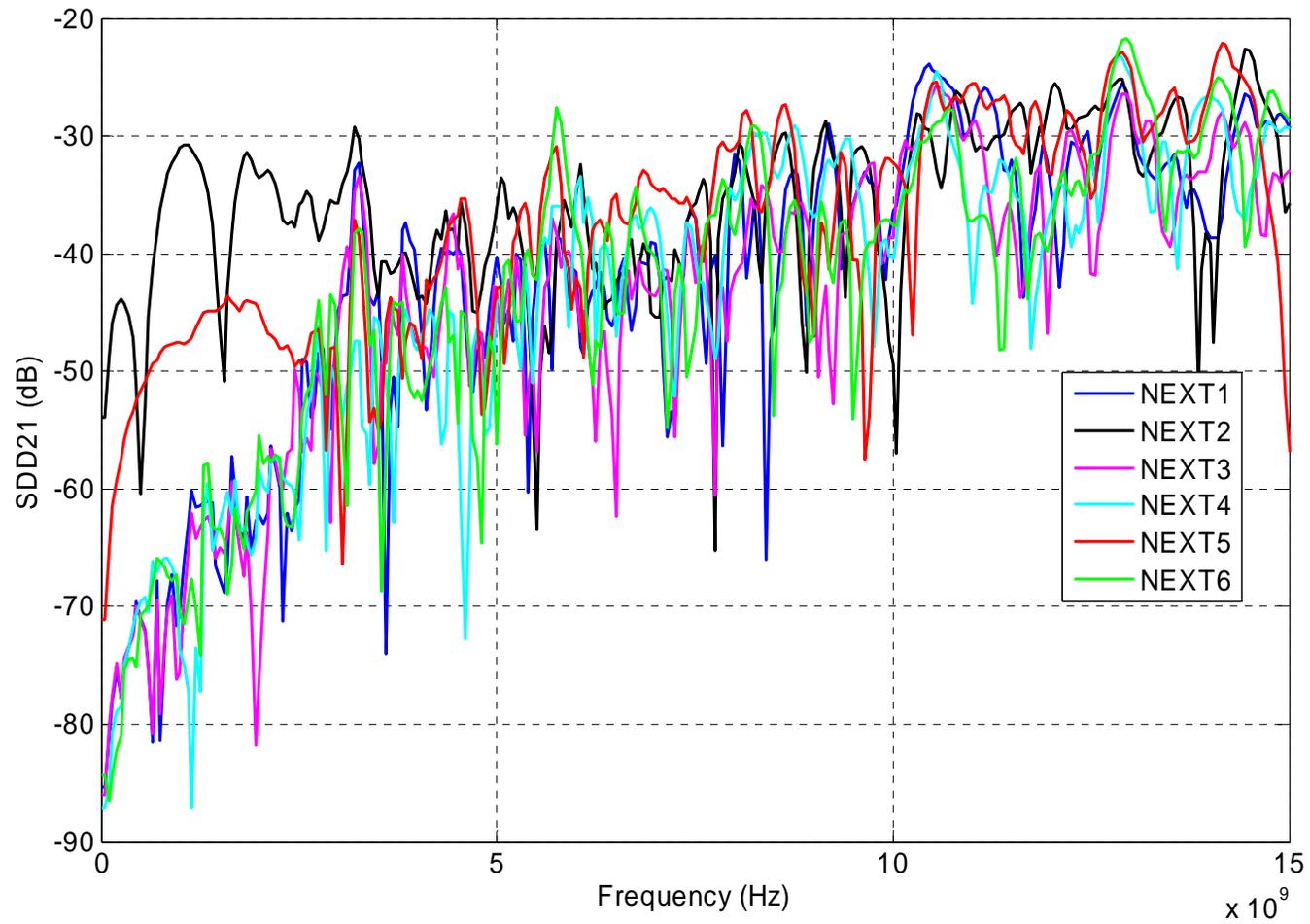
## B12 channel NEXT aggressors



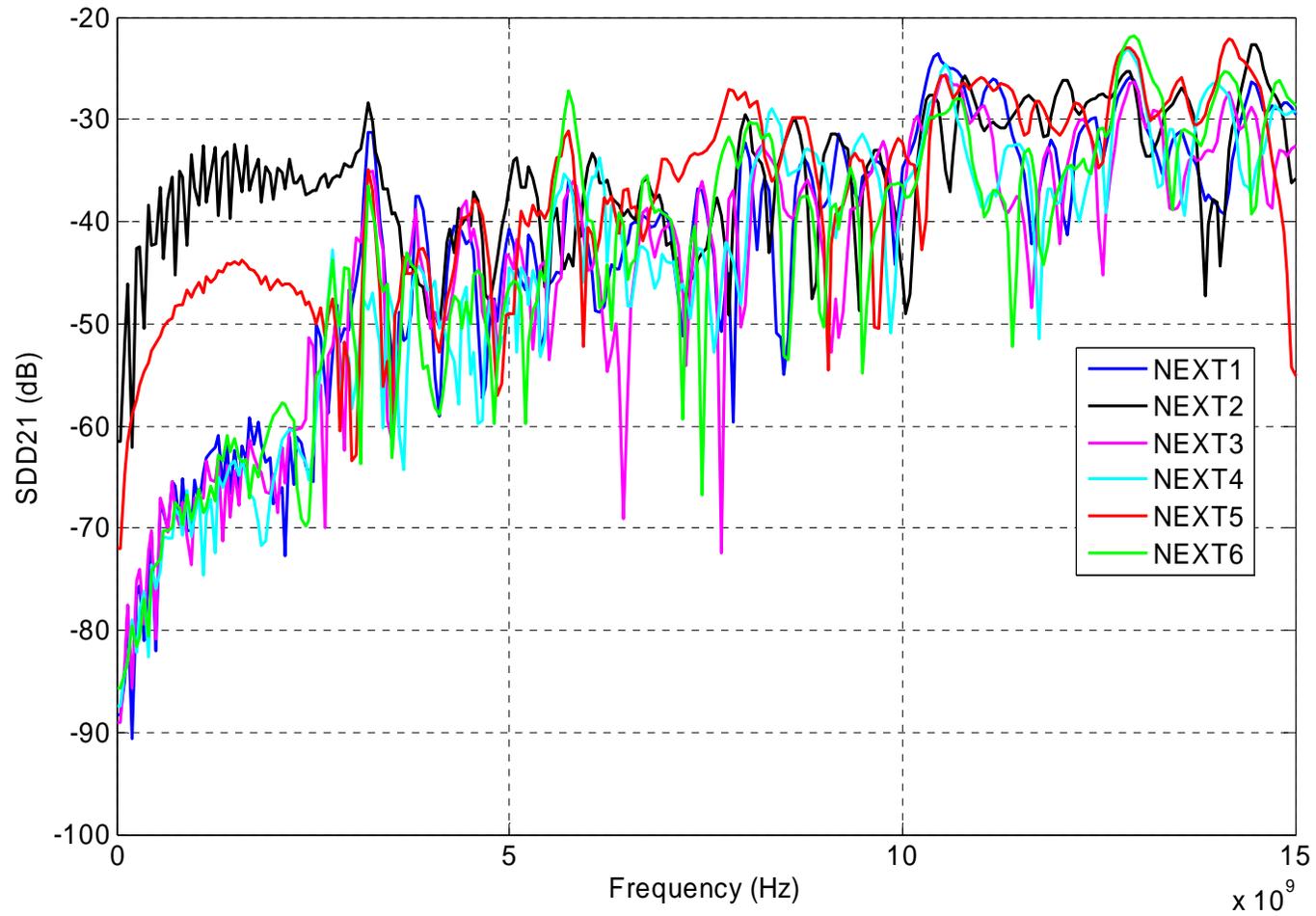
## B20 channel NEXT aggressors



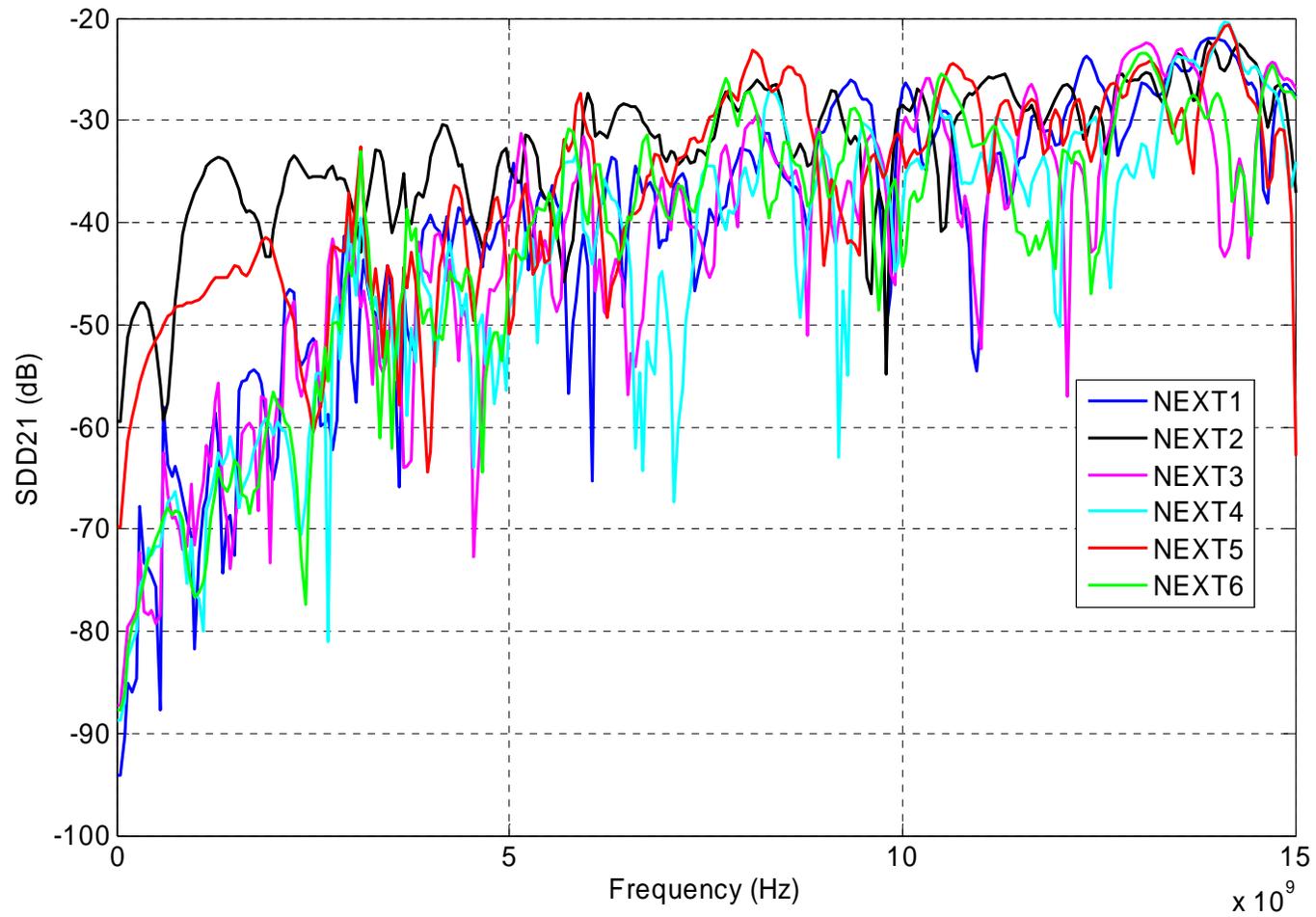
# M1 channel NEXT aggressors



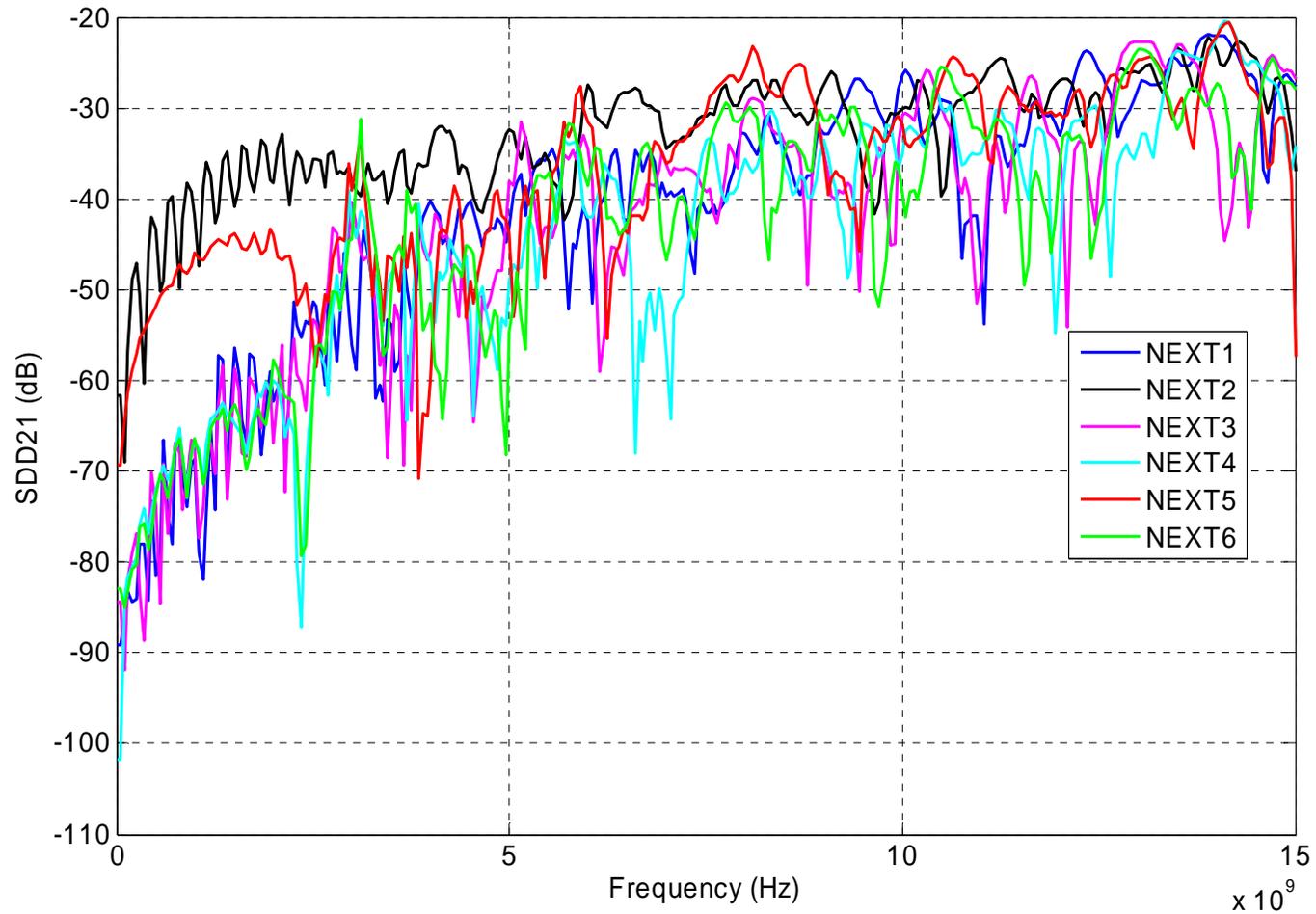
# M20 channel NEXT aggressors



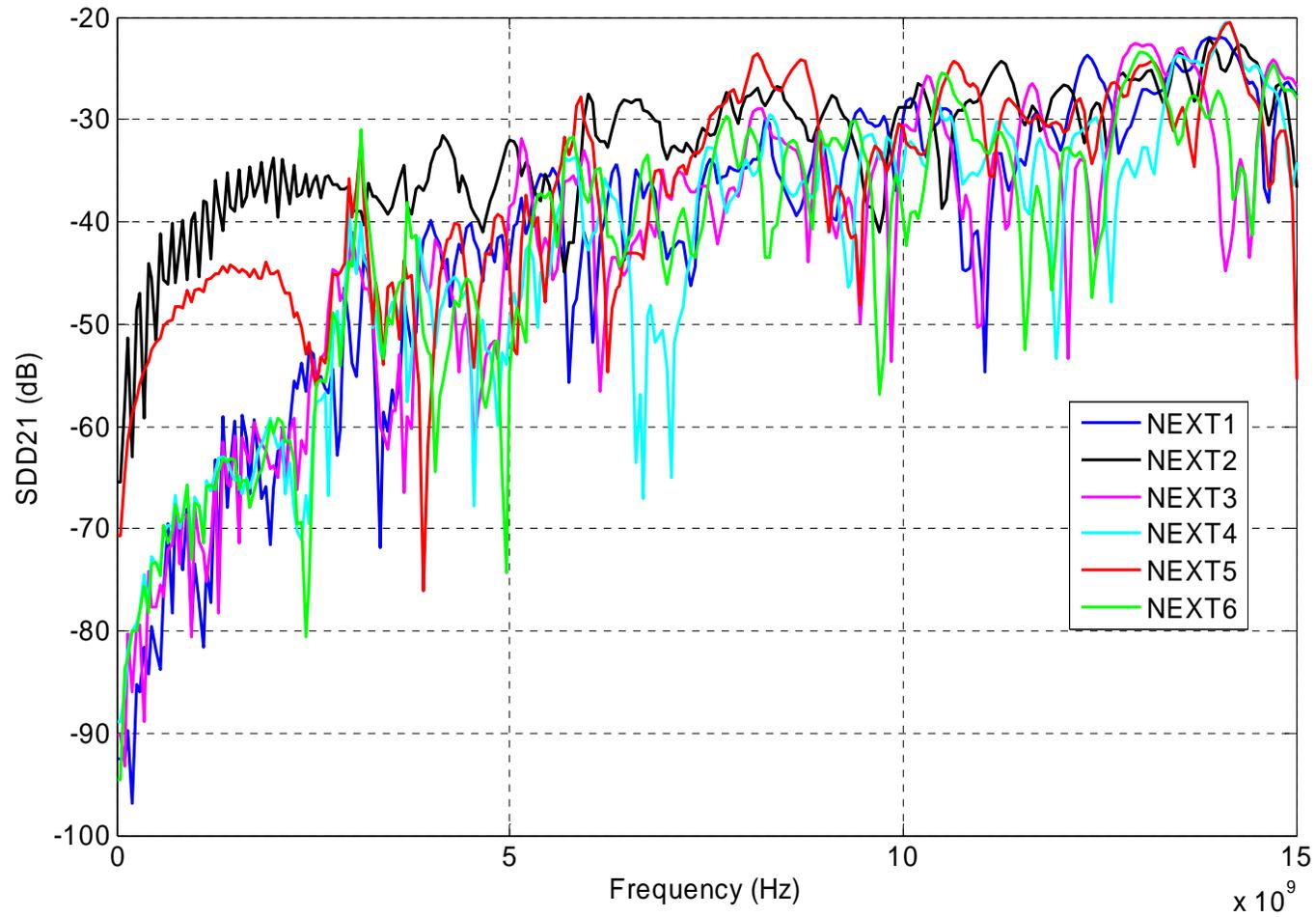
# T1 channel NEXT aggressors



# T12 channel NEXT aggressors

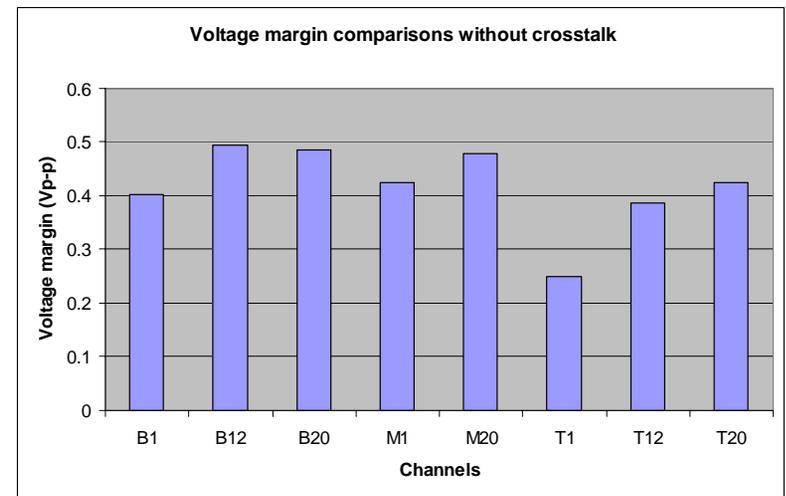
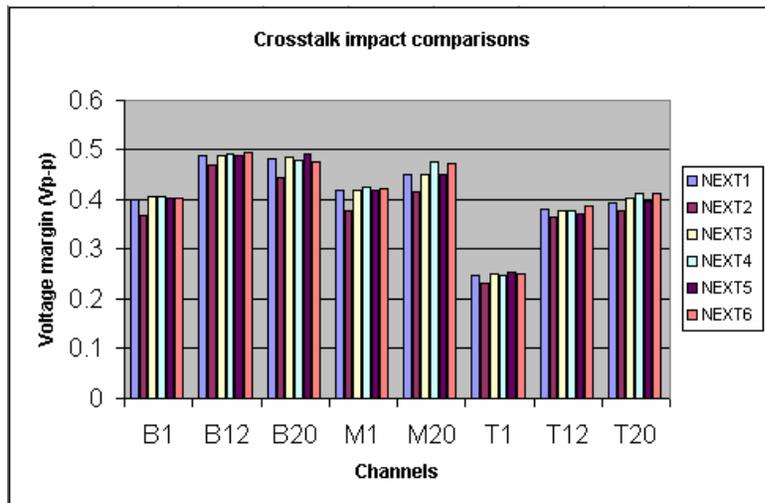


## T20 channel NEXT aggressors



# Simulation results and comparisons

Eye open voltage margin Vp-p (cap-like package) with NEXT crosstalk								
	B1	B12	B20	M1	M20	T1	T12	T20
<b>NEXT1</b>	0.401501	0.489746	0.482446	0.420335	0.450027	0.246506	0.380116	0.394094
<b>NEXT2</b>	0.369593	0.469111	0.445629	0.378353	0.416107	0.232835	0.363553	0.376797
<b>NEXT3</b>	0.405631	0.48746	0.485104	0.420552	0.45071	0.250582	0.378827	0.404659
<b>NEXT4</b>	0.405302	0.491568	0.478308	0.424738	0.477605	0.247415	0.378608	0.414238
<b>NEXT5</b>	0.404095	0.488983	0.491258	0.418154	0.451522	0.25364	0.372264	0.397038
<b>NEXT6</b>	0.404063	0.495877	0.476053	0.421445	0.472286	0.252034	0.388571	0.411567
Eye open voltage margin Vp-p (cap-like package) without crosstalk								
	B1	B12	B20	M1	M20	T1	T12	T20
	0.402943	0.493572	0.484342	0.424298	0.479088	0.249555	0.387077	0.424013



## Conclusions

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- **Worst case crosstalk aggressor selection should be based not only on their frequency domain characteristics but also on the evaluation of their impacts on equalization results**
- **The differences caused by the NEXT at the low frequencies are small and have little impacts on equalization performance**