Tolerances for initial condition coefficients

(comment #333)

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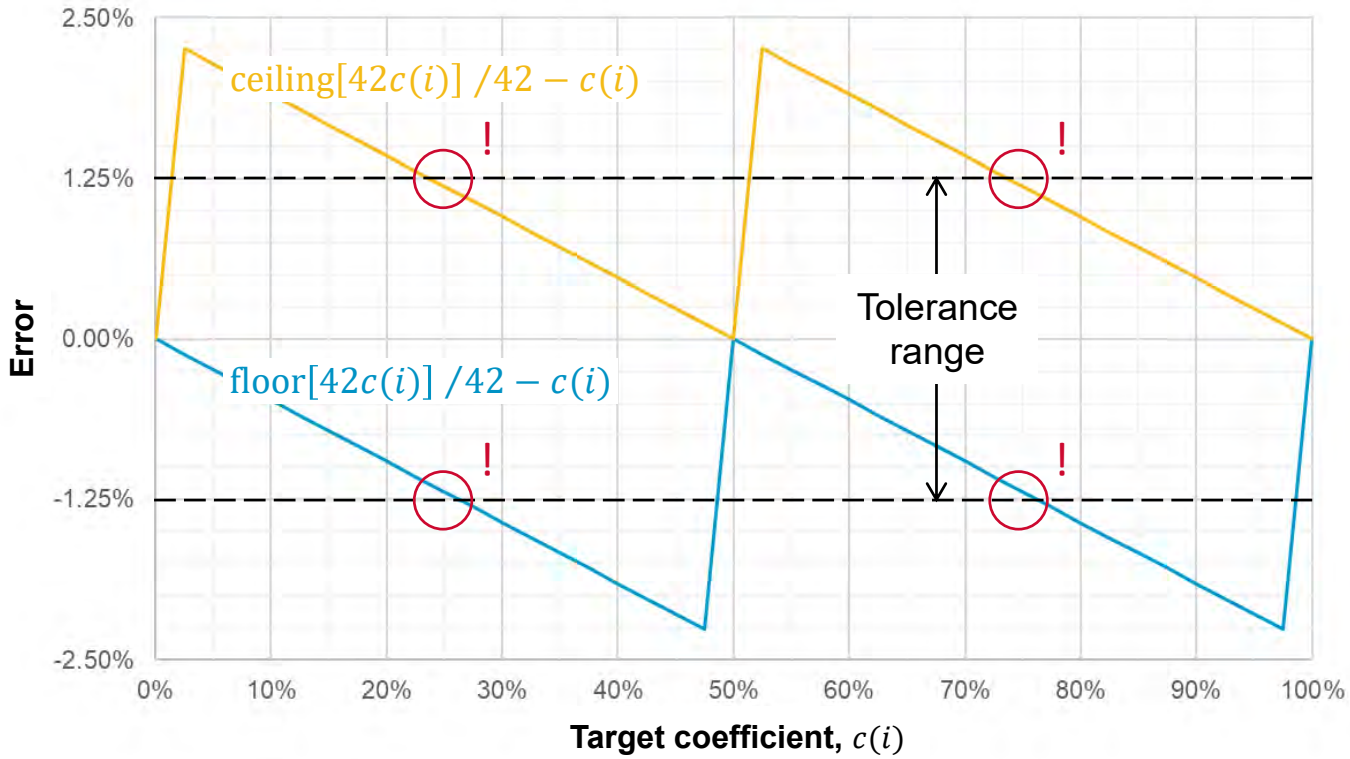
Problem statement

Coefficient initial conditions

ic_req	c(−3)	c(−2)	c(−1)	c(0)	c(1)
1	0	0	0	100%	0
2	0	0	0	50%	0
3	0	0	−7.5%	75%	0
4	0	5%	−20%	75%	0
5	−2.5%	7.5%	−25%	65%	0

Example transmitter with coefficient step size of 1/42 (< 2.5%)



- The coefficient tolerance range for transmitter equalizer initial conditions is ±1.25%
- It is possible to get very close to these limits even with a compliant coefficient step size
- This is the result of misalignment between the set of achievable coefficient values the 2.5% “grid” on which the nominal initial condition coefficients are based

Does the tolerance range need to be that tight?

- Issue is more pronounced for coefficient step sizes closer to the 2.5% limit
- Example shown reflects the native step size for a 7-bit digital-to-analog converter
- There is very little margin to the specification for this otherwise valid implementation

- Very precise initial condition coefficients are not necessary since ...
- ... a receiver feed-forward equalizer is likely available to make local adjustments or ...
- ... additional transmitter adjustments can be made using increment and decrement commands

- Recommend increasing the coefficient tolerance range to $\pm$2.5%
- This modest increased in tolerance range still provides a very reliable starting point for link training