Differences in Jitter specs CAUI4 chip-chip vs 100GBASE_KR4 Update

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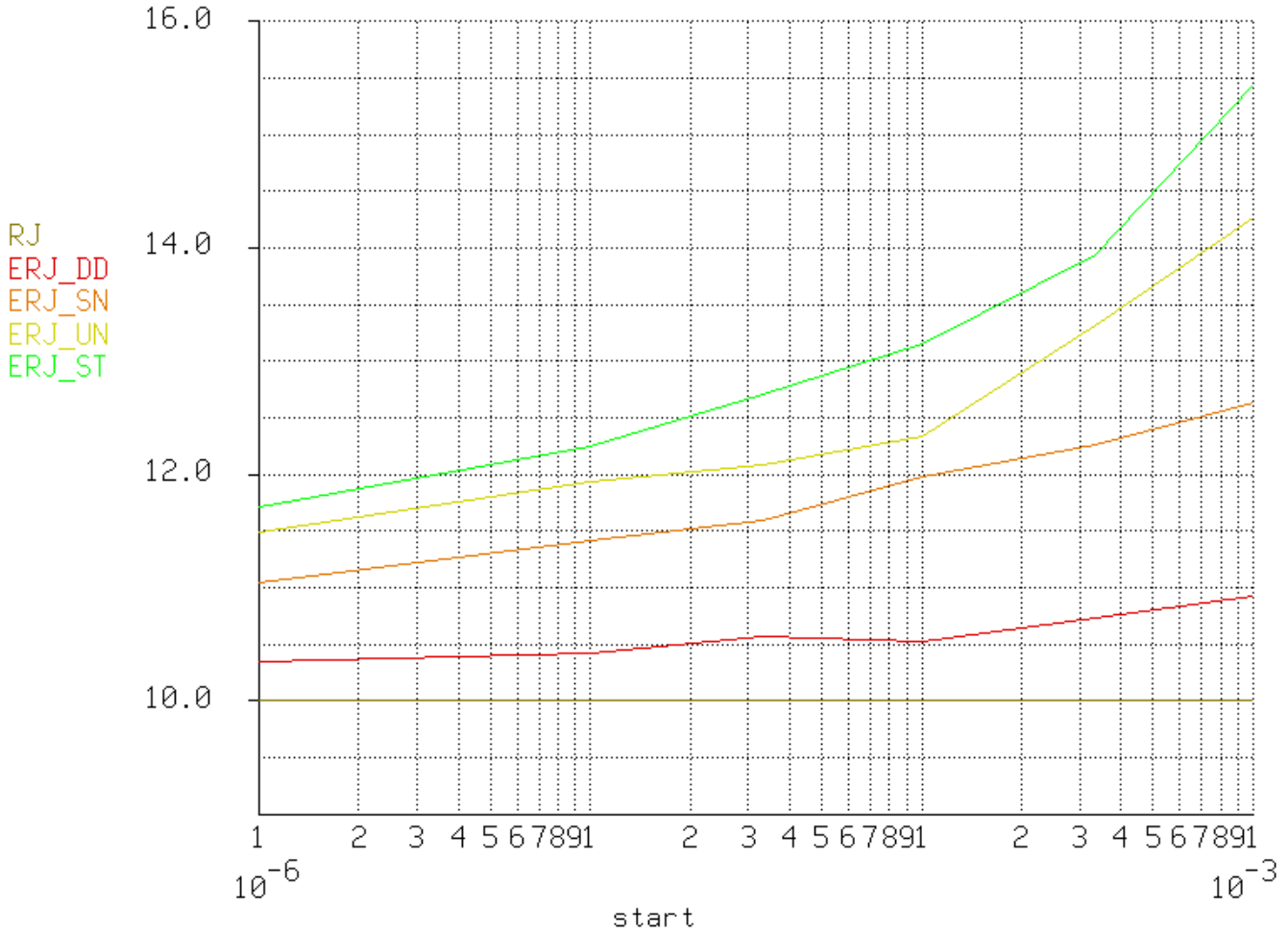
2014 February 21

Last week I recommended that we do the linear fit to the CDF “at higher values of Q” but did not recommend values. Clause 92.8.3.9.2 c) gives a range of hits to the fitting over as a fraction of the total from 10^{-3} to 2.5×10^{-2}. I will call these values start and end and assume that end=25*start. I will also use the conventions:

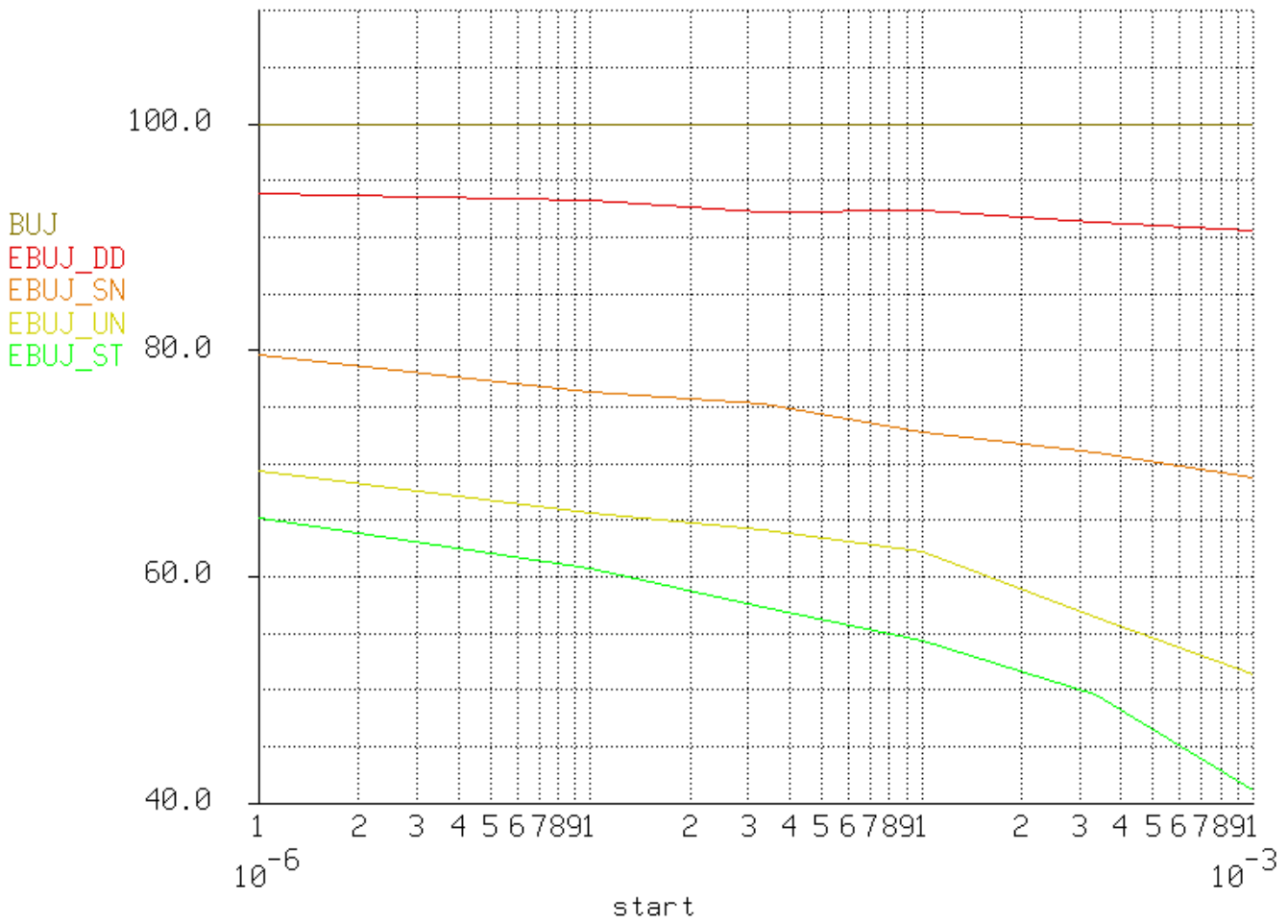
ERJ_XX	is effective (computed) random jitter for case XX
EBUJ_XX	is effective (computed) bounded uncorrelated jitter for case XX
ETUJY_XX	is effective (computed) Total uncorrelated jitter at BER=10^{-Y} for case XX
RJ	is actual (applied) RJ
BUJ	is actual (applied) bounded uncorrelated jitter
if	
XX=DD	it is the dual Dirac case
XX=SN	it is the sinusoidal case
XX=UN	it is the uniform case
XX=ST	it is the stepped PDF case

RJ is RMS
BUJ and TUJ is peak to peak.

We expect that as we decrease start, ERJ and EBUJ will approach RJ and BUJ.



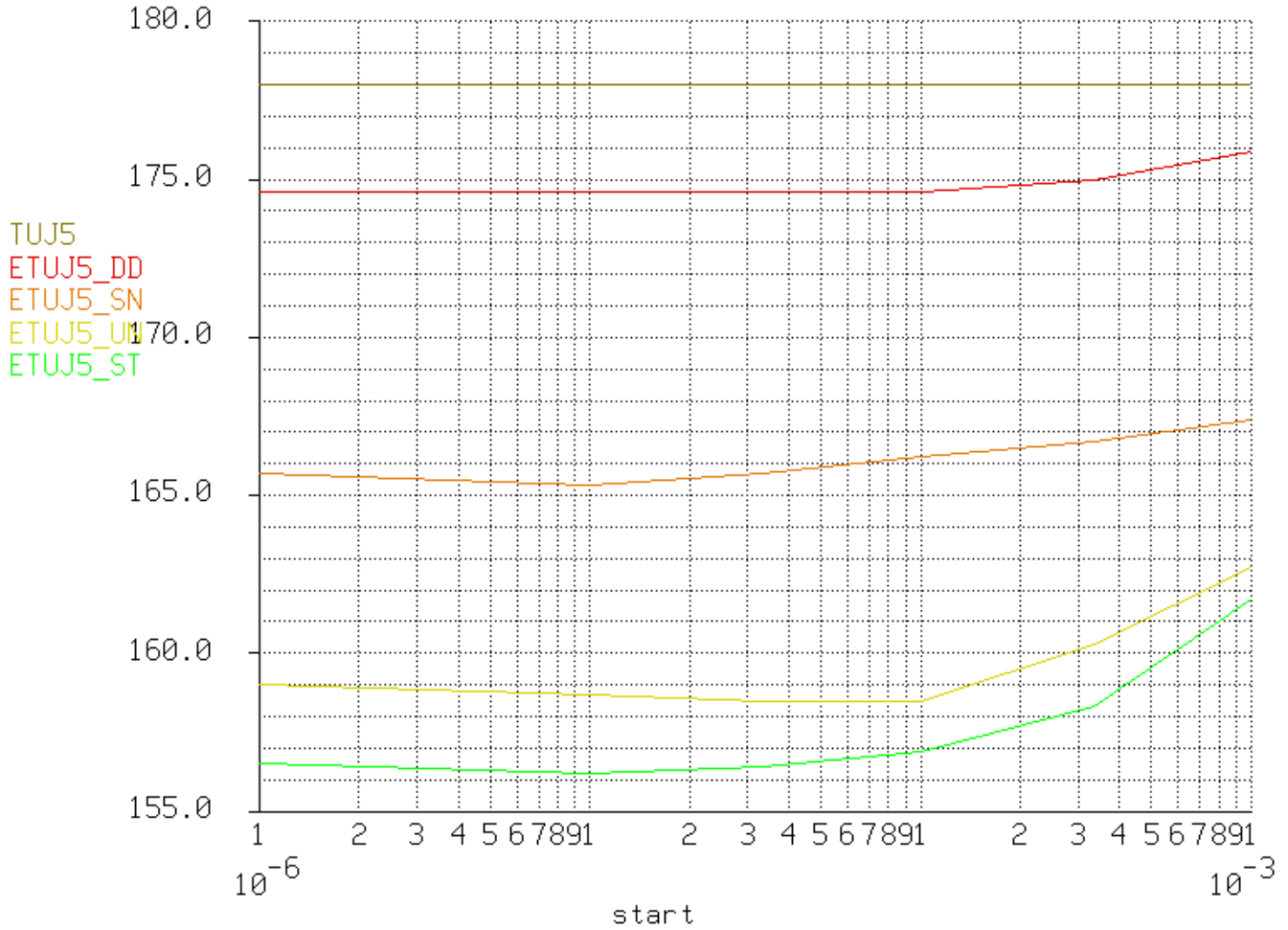
ERJ does get closer to actual RJ with lower starting interpolation ranges but it is not getting there soon. ERJ is always over estimated.



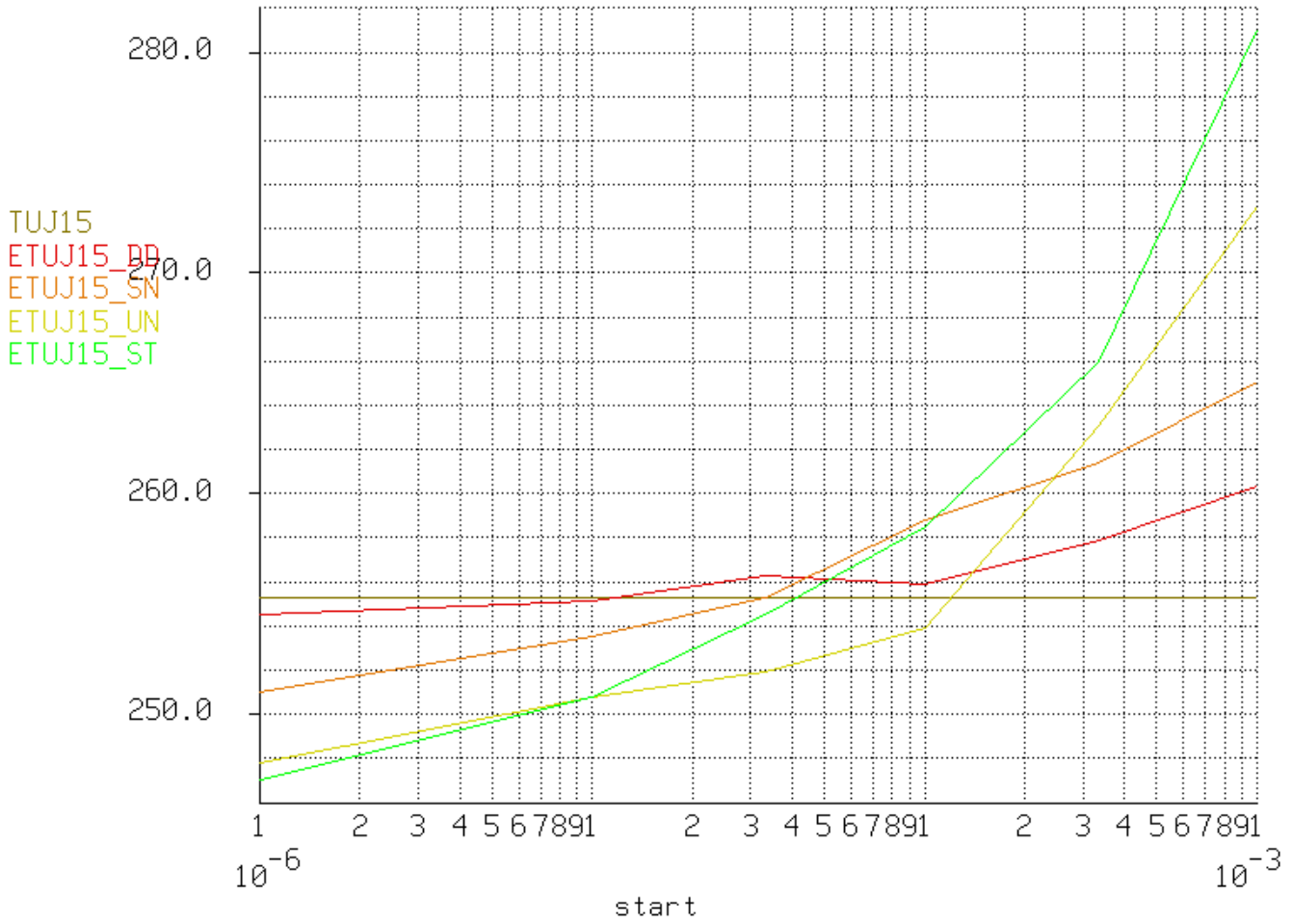
Like ERJ, EBUJ approaches the correct value for small start values but slowly. The reverse of ERJ, EBUJ is always under estimated.

If ERJ is overestimated and EBUJ is underestimated might a weighted sum of the two be reasonably accurate ETUJY is a weighted sum lets look a some values:

ETUJ5 = EBUJ + 7.9 * ERJ (from equation 92-21)



This makes it look like the extrapolated value is low but in reality the fitting range is close enough to the desired point that the real error is not bad. See moore_3bj_0114.pdf



This shows the accuracy of the extrapolated TUJ15 for various cases. It looks like we have a “sweet spot” at start=10^{-4} which is 1/10 the value used in Clause 92. This means that we will need to receive 10x the number of hits which should be OK.