

Mask and noise effects for SRn

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- Looking to see if mask spec does what we think it does
- First case: SRn mask at TP1

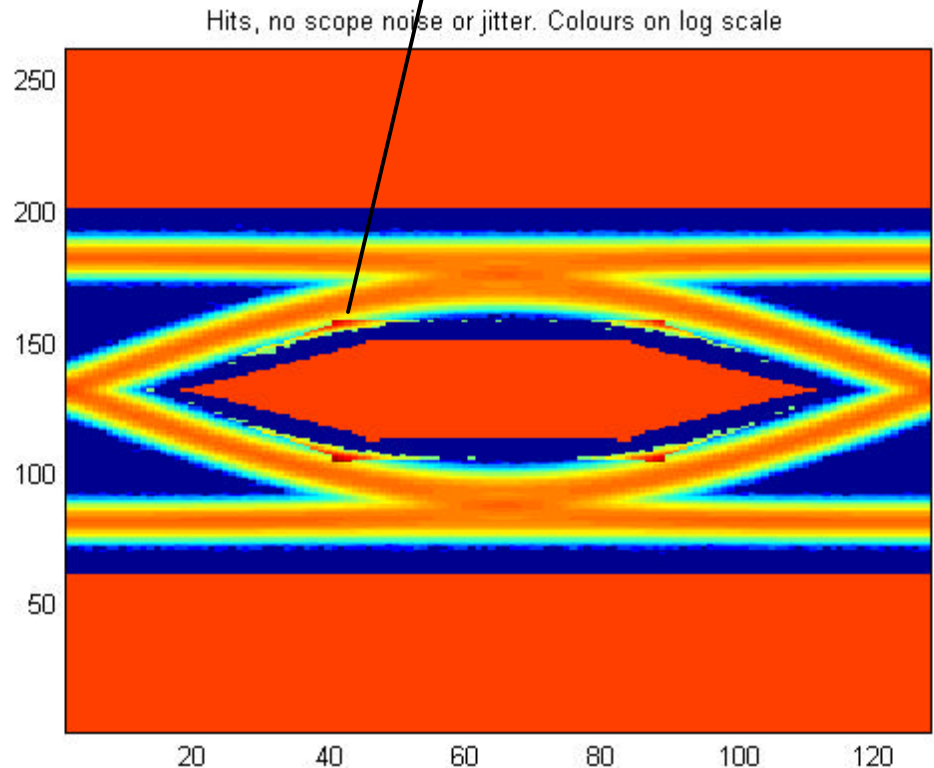
Slow eye, mask at $5 \cdot 10^{-5}$

- Slow marginal eye at B:
 - Gaussian risetime 50 ps before a 12 GHz BT observation filter
 - SJ=0.02 UI
 - Vertical noise causes nearly all the apparent random jitter
 - TJ=0.284 UI
- Mask 0% coordinates are 0.14, 0.35, 90, 350
- Mask +25% coordinates are 0.105, 0.2625, 101, 319
- D1.1 coordinates are 0.12, 0.33, 95, 350
- D1.1 eye could be much worse than shown and still pass the mask
- John Petrilla proposes 0.12, 0.25

Orange: 0% mask

Hits show extent of +25% mask

Note eye can be slower than mask and encroach corners significantly



Statistics at TP1a not same as at TP2

- Roughly, the horizontal effects propagate from B via TP2 to the decision circuit in a moderately linear way. Hence can use Gaussian statistics, with allowance for slew rate effects
- But the vertical effects don't propagate linearly
- There is a slicer or limiting amplifier in the laser driver whose PDF is completely unspecified, except that it is less than $2 \times \sim 90 \text{ mV}$ high to $\sim 10^{-7}$
- It could contain significant high probability effects e.g. patterning, hysteresis and still be a good transmitter with a respectable input eye
- But signal at TP2 will deteriorate disproportionately with a slow, noisy eye at TP1

Options

- Options are
 - Eliminate the ultra-slow eyes
 - Reduce X2
 - Eliminate the ultra-noisy eyes
 - Add Qsq spec and a requirement in words that baseline wander shall not cause significant degradation
 - Not a solid testable (objective) spec
 - Tighten up the statistical significance of the mask
 - Increases test time (x10 lanes!) and cost
 - Impose a relative mask
 - Keep Y2/Y1 to reasonable limit
 - Forces the eye to be relatively not too slow, good defence against patterning
 - No added test time, only test software to extract another conclusion from the same mask measurement
 - Other option?

Conclusion

- Add relative mask spec at TP1a
 - Objective and testable but does not add to test time, cost