ANALOG DEVICES

AHEAD OF WHAT'S POSSIBLE™

Worst Case Node Position

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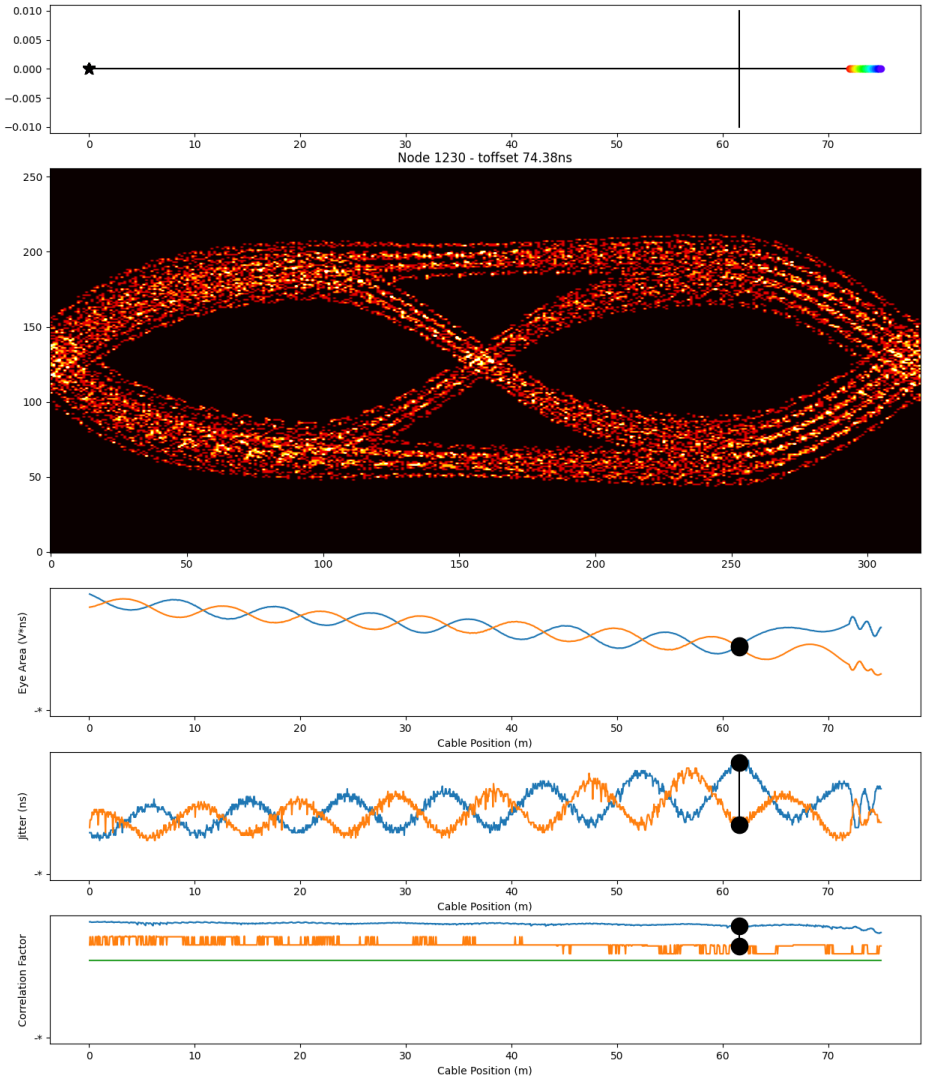
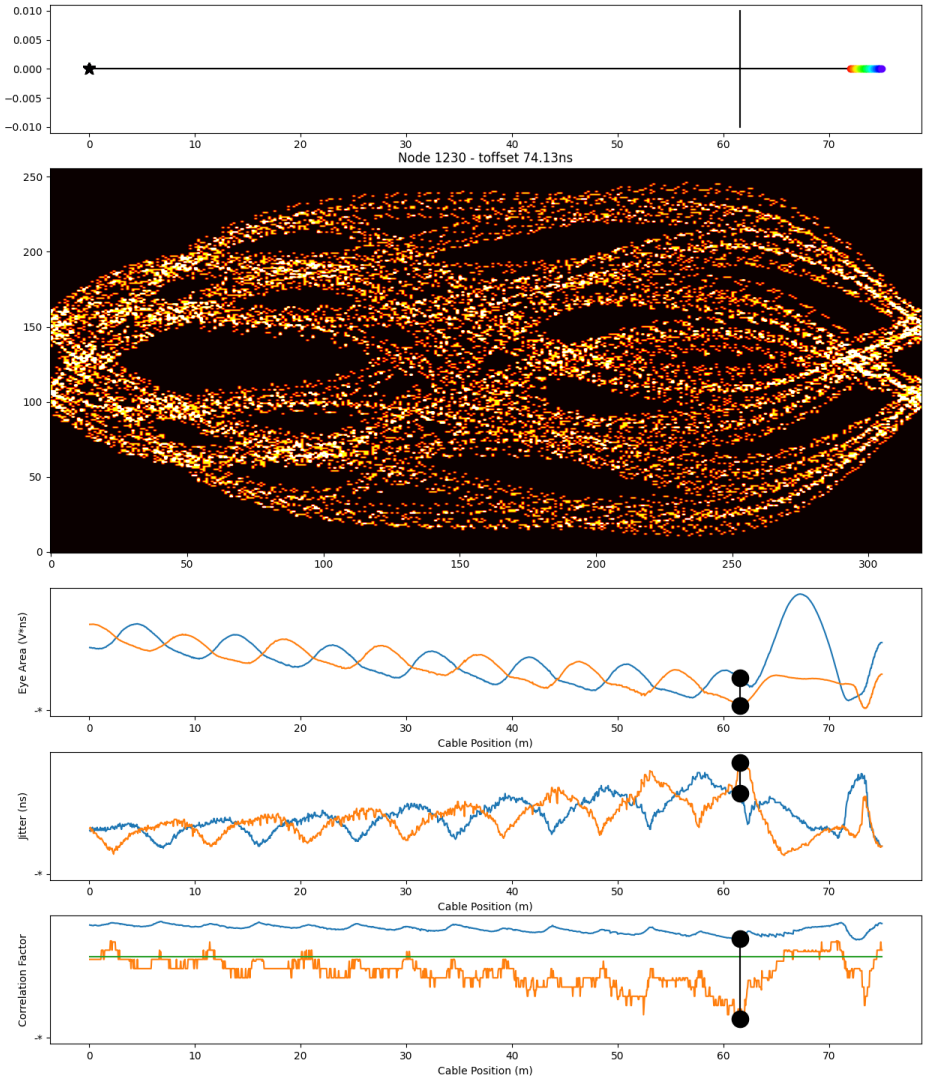
Introduction

- Follow up from a discussion in Bangkok
  - Where is the “worst case” position on a cable
- Use Consensus Model and measure every spot on the cable
- Following Simulations
  - 75m Cable
  - 31 Nodes clumped at end
  - 1 node at the beginning of cable
  - 10cm separation
  - 1cm drop length
  - 30pF Cnode (unless otherwise stated)

Compensated vs Uncompensated

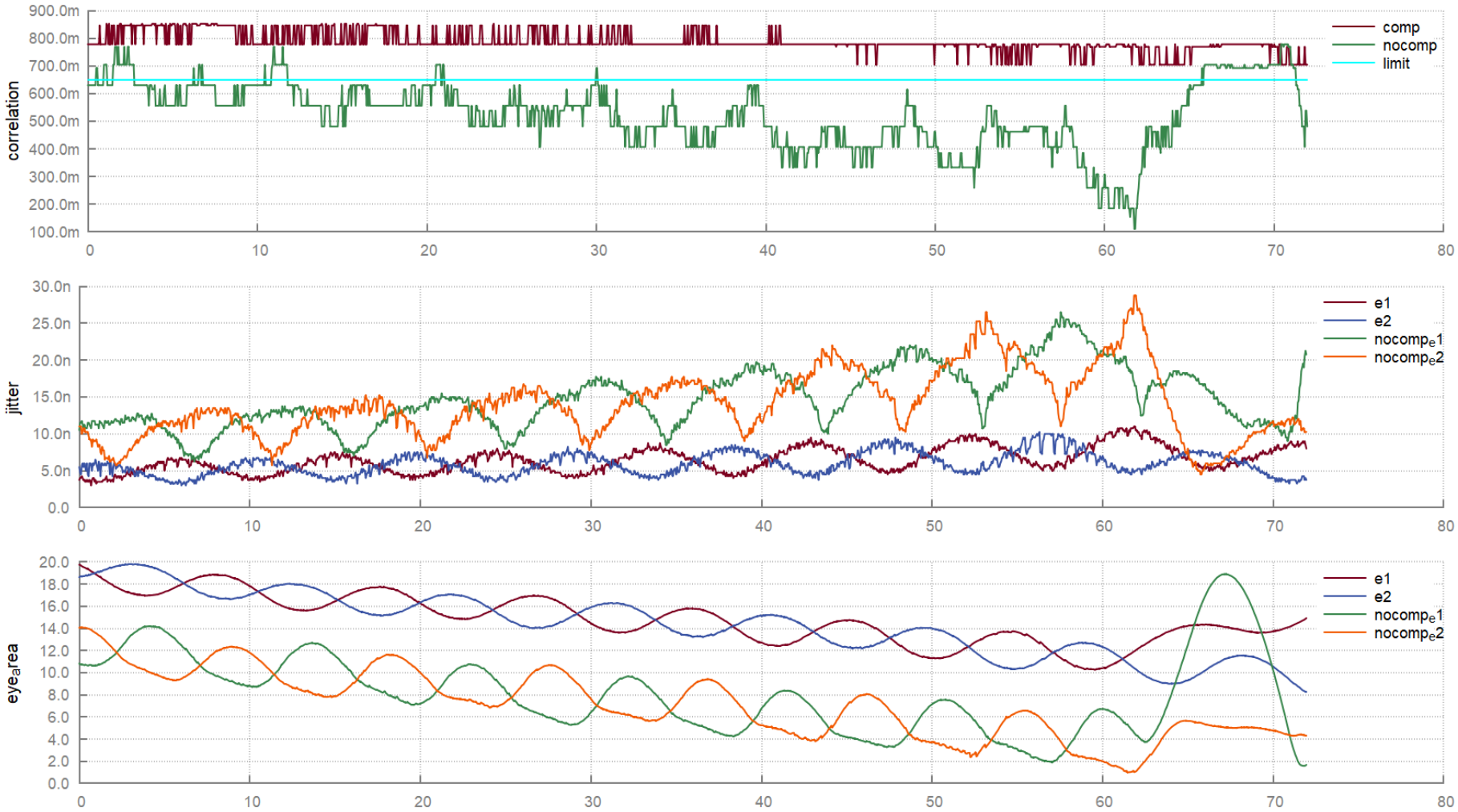


▶ Compensated

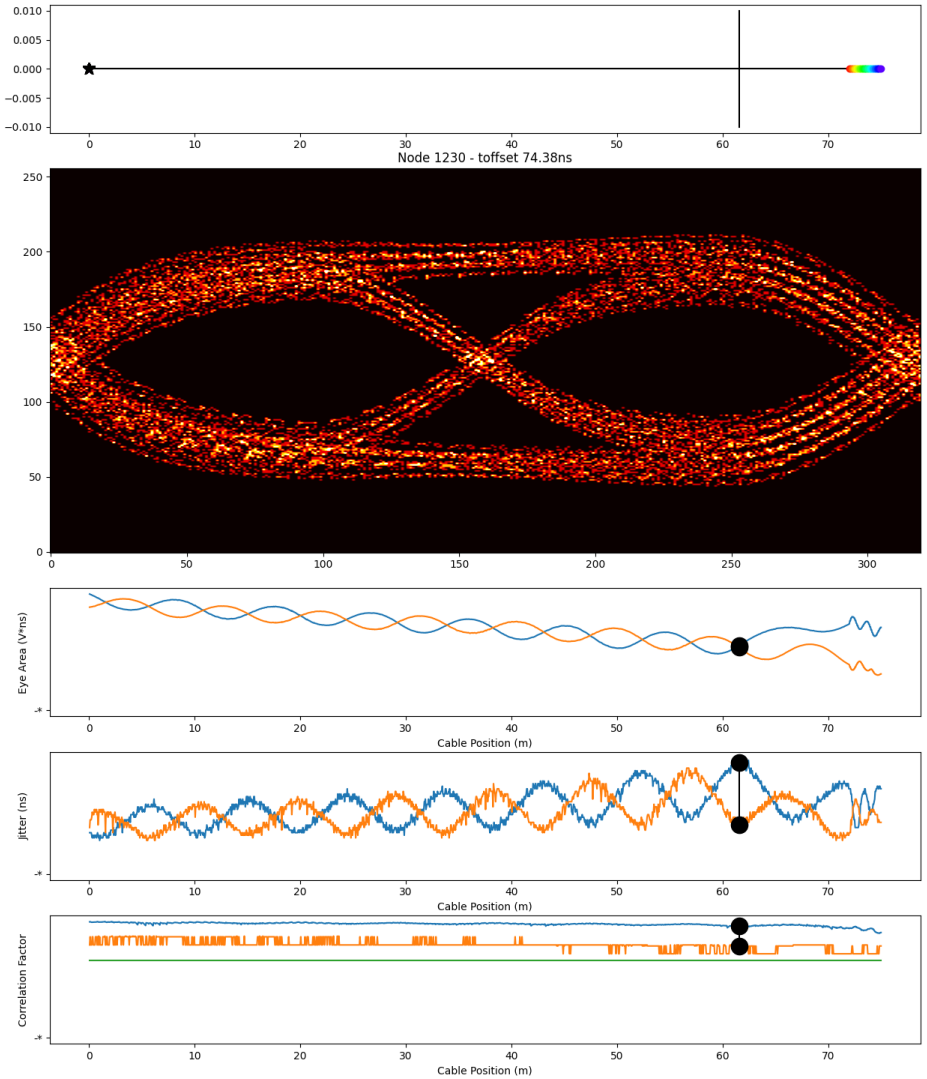


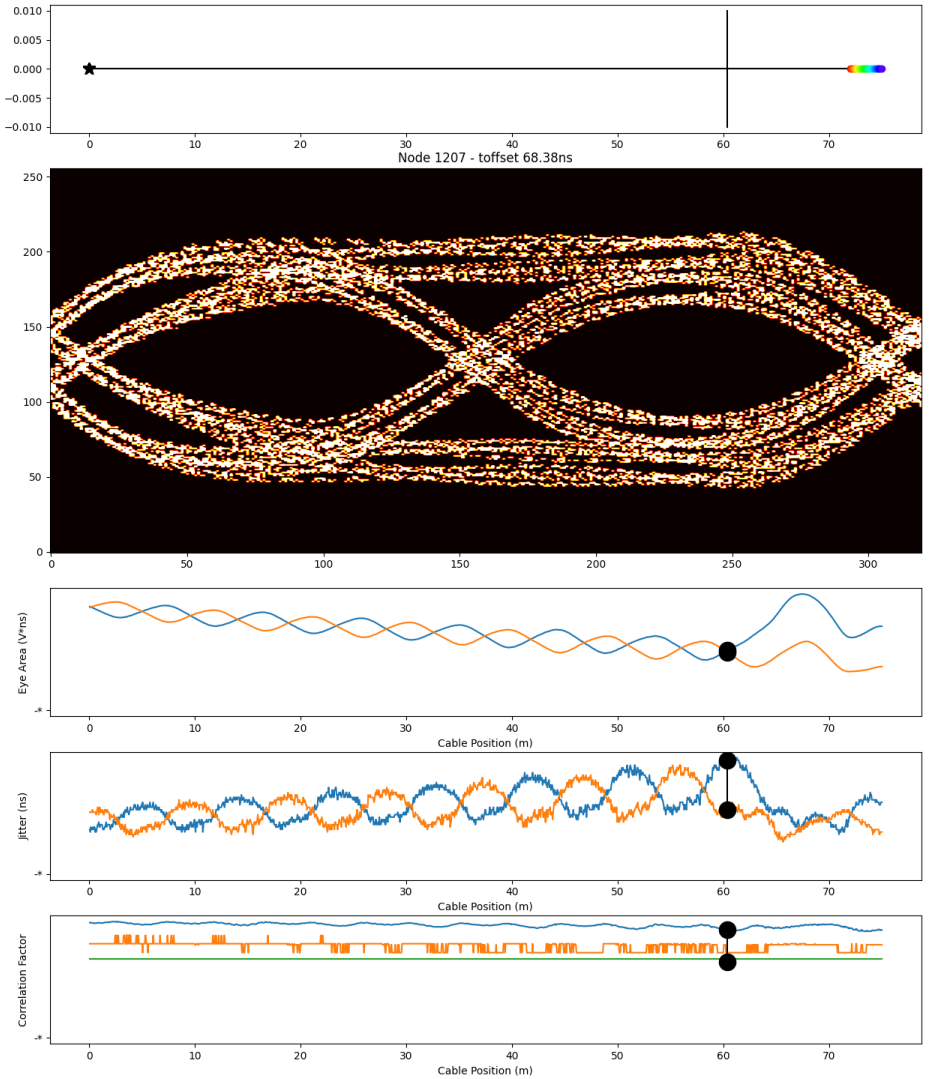
▶ Uncompensated

Compensated vs Uncompensated



Compensated vs Low Cap



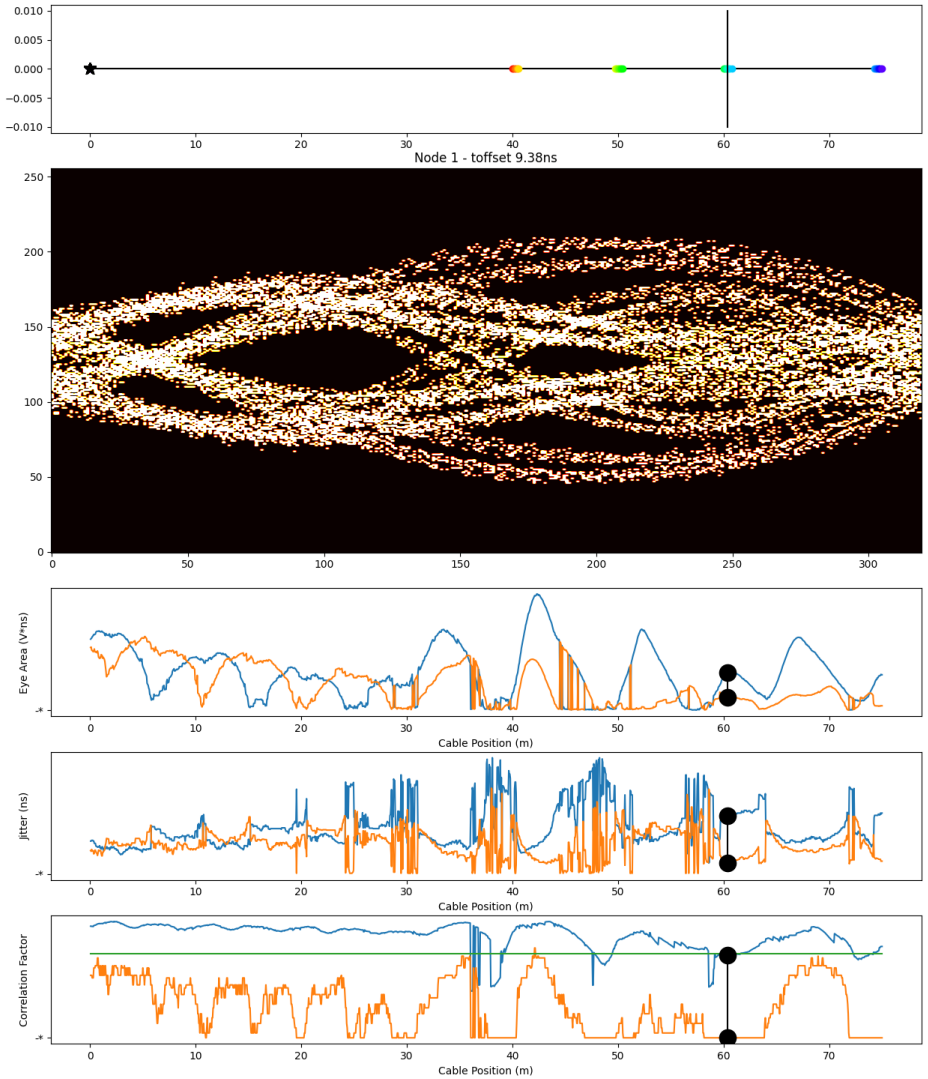


- Compensated, Cnode=30pF
- Uncompensated, **Cnode=5pF**

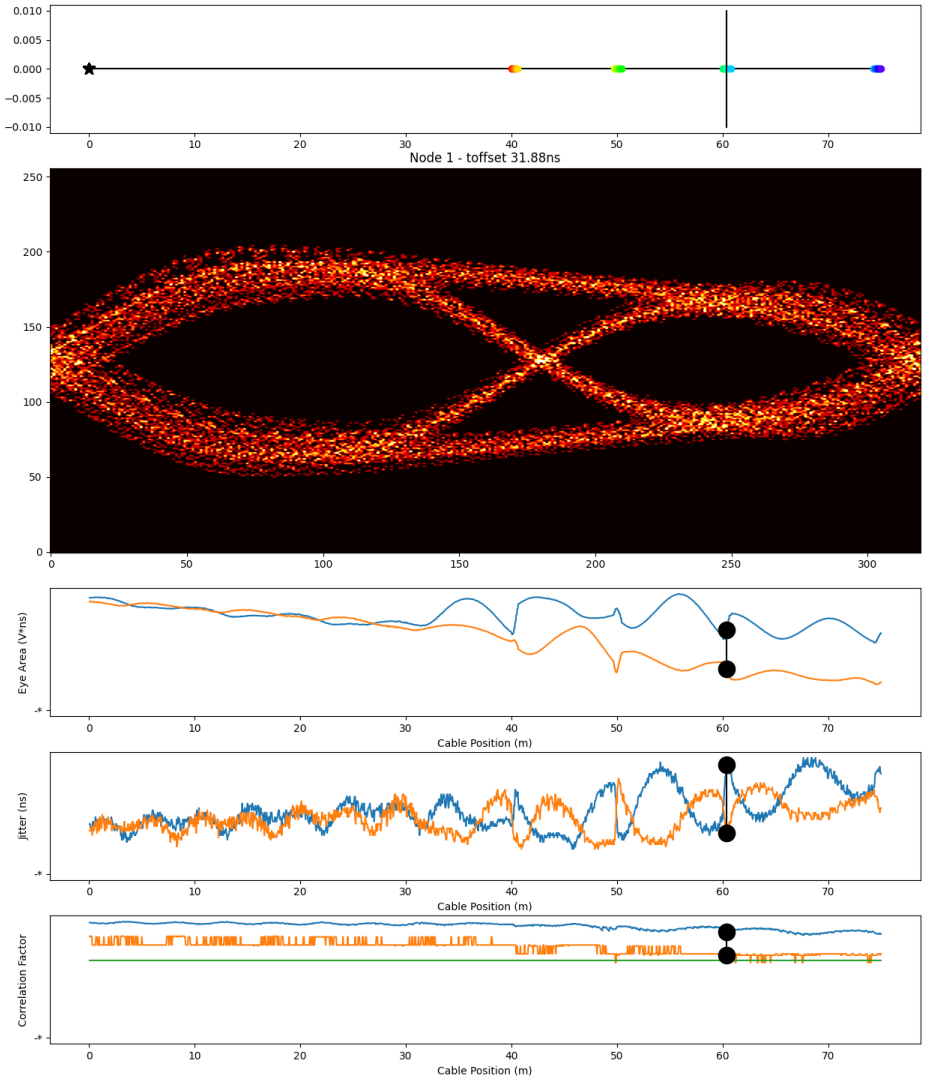
Several Clumps

- Previous sims show a “bad” spot around 62m / 75m
- Place place clumps at the end of the cable, and in bad spots
- Following Simulations
  - 75m Cable
  - 31 Nodes clumped in different groups
    - 8 at the end of the cable
    - 8 around 60m
    - 8 around 50m
    - 7 around 40m
  - 1 node at the beginning of cable
  - 10cm separation
  - 1cm drop length
  - 30pF Cnode (unless otherwise stated)

Several Clumps

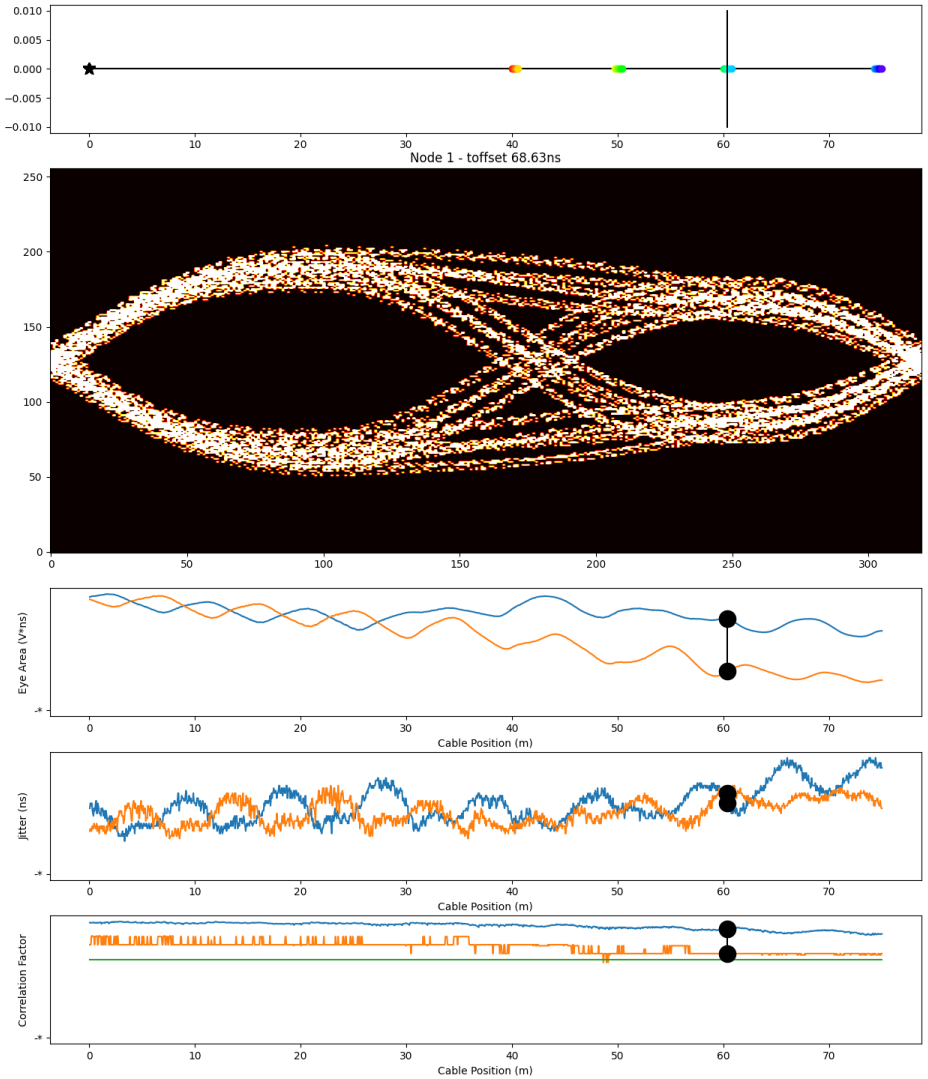


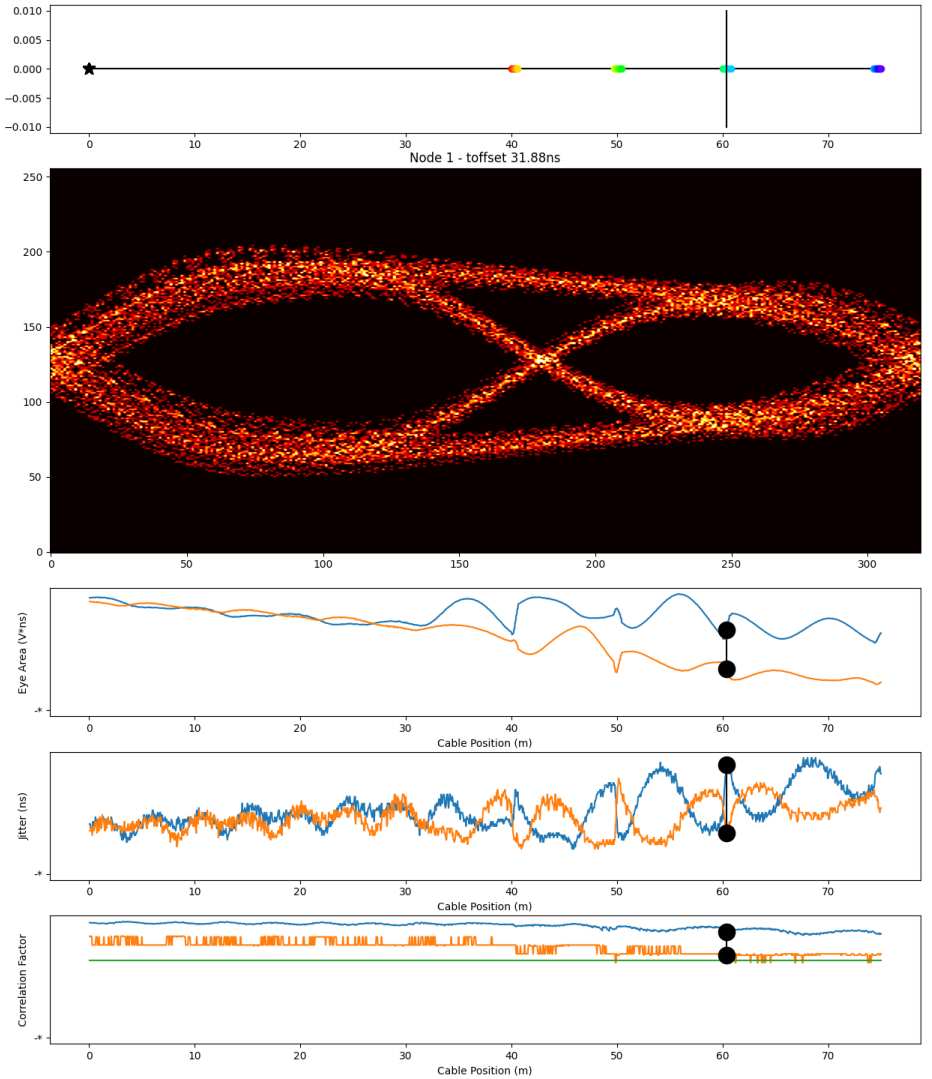
▶ Uncompensated, Cnode=30pF



▶ Compensated, Cnode=30pF

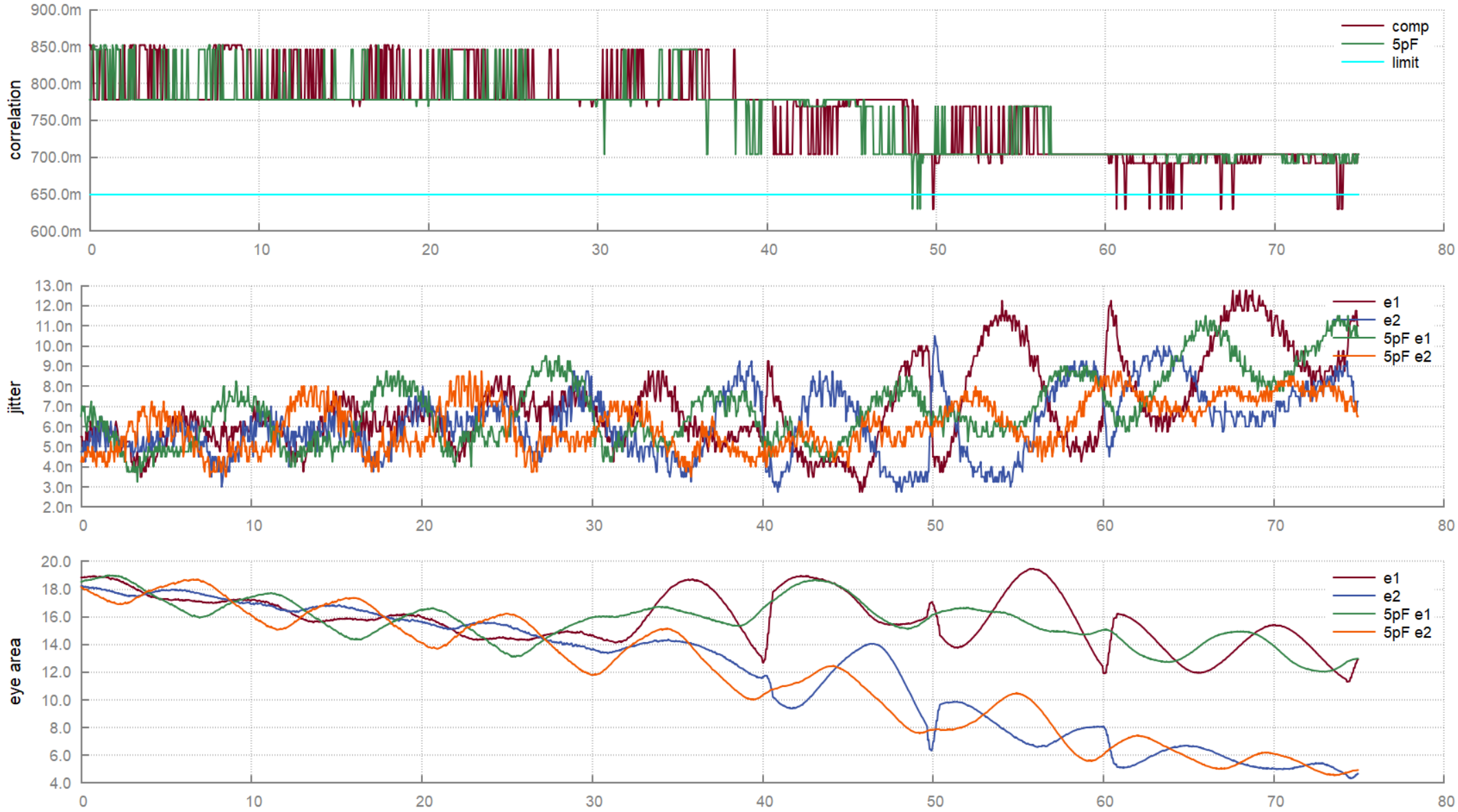
Several Clumps





- Uncompensated, Cnode=5pF
- Compensated, Cnode=30pF

Comparing Several Clumps (comp'd vs 5pF)



Conclusion

- We can inspect the full cable for “worst case” attachment points
  - Using this data an even worse case than previously known was found
- We are going to need rules about how much a node can reflect
  - Either compensate nodes that have high parasitic capacitance
  - Or design nodes that have low parasitic capacitance (<5pF?)