IBIS-AMI and Statistical Analysis

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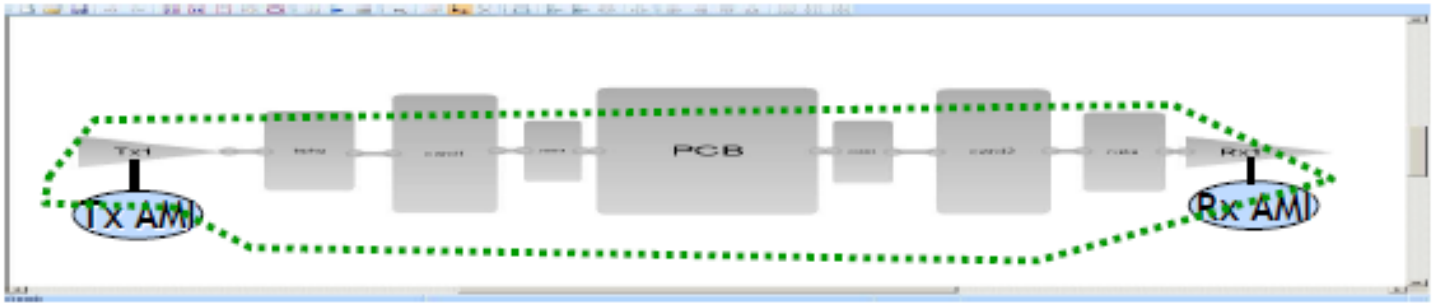
IBIS-AMI Key Concepts

- The Tx –to– Rx pathway is composed of 3 separate entities
  - Tx algorithmic part
  - The analog channel
  - The Rx algorithmic part
- Three “decoupled” parts can be ***independently*** solved in time domain
- Executable model delivered as a dynamically linked library (DLL)
  - Data flow between these three parts is addressed by the standardized API
  - Robust and flexible parameter passing to Tx & Rx



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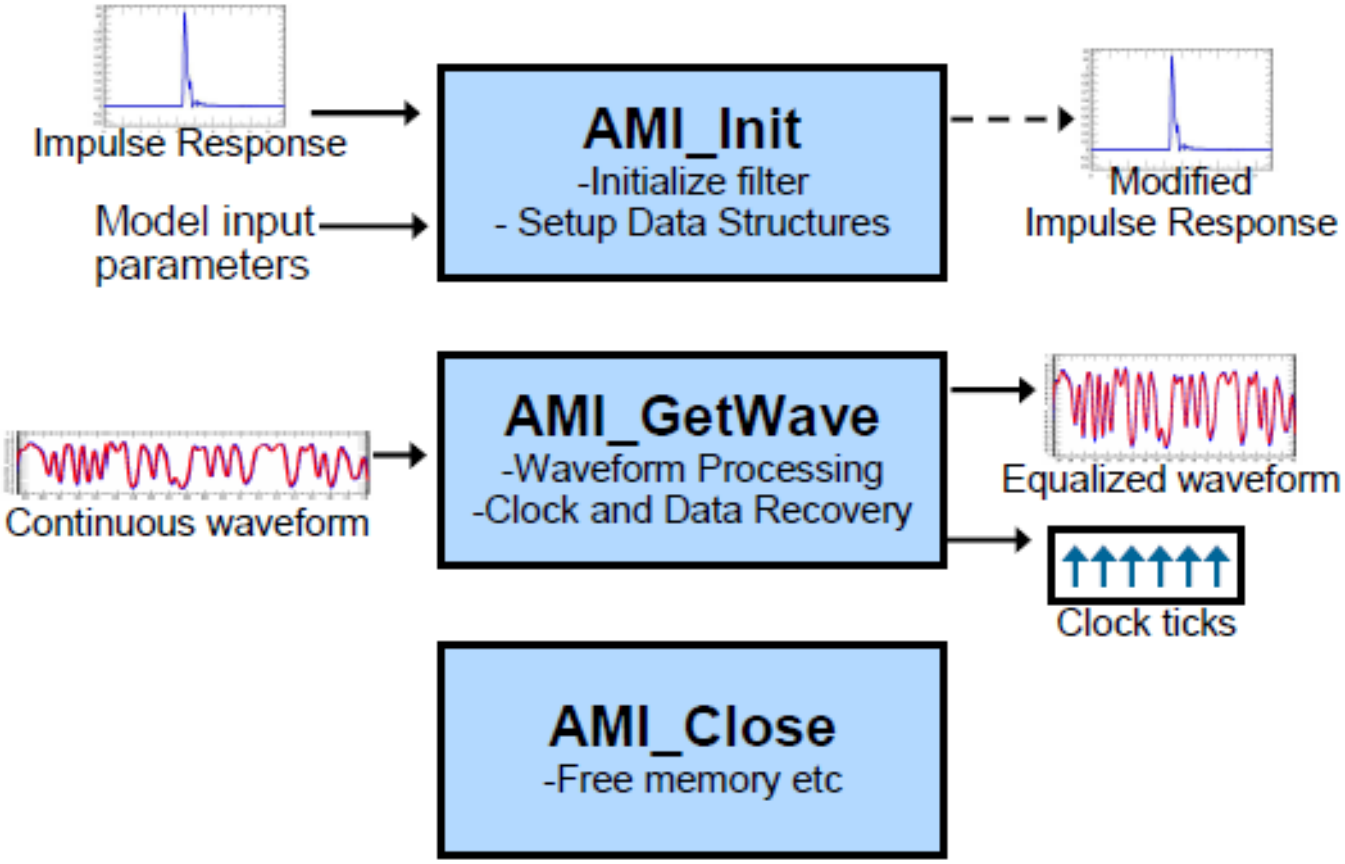
IBIS AMI Data Flow API



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IBIS-AMI and Statistical Analysis

- AMI “LTI” Models
  - No AMI_GetWave call
  - Returns Modified Impulse Response (LTI Characterization)
  - Supports Time Domain Analysis
  - Supports Statistical Analysis
- AMI “Non-LTI” models
  - Uses AMI_GetWave call
    - Cannot assume to know inner workings of DLL “black box”
  - Supports Time Domain Analysis

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Non- LTI AMI Models

- Usually Receiver Models
- Adaptive DFE
- Pattern Dependent Equalization
- Time Domain Clock and Data Recovery

- Only ***limited*** Statistical Analysis is possible
  - Ex. post-processing of time domain data

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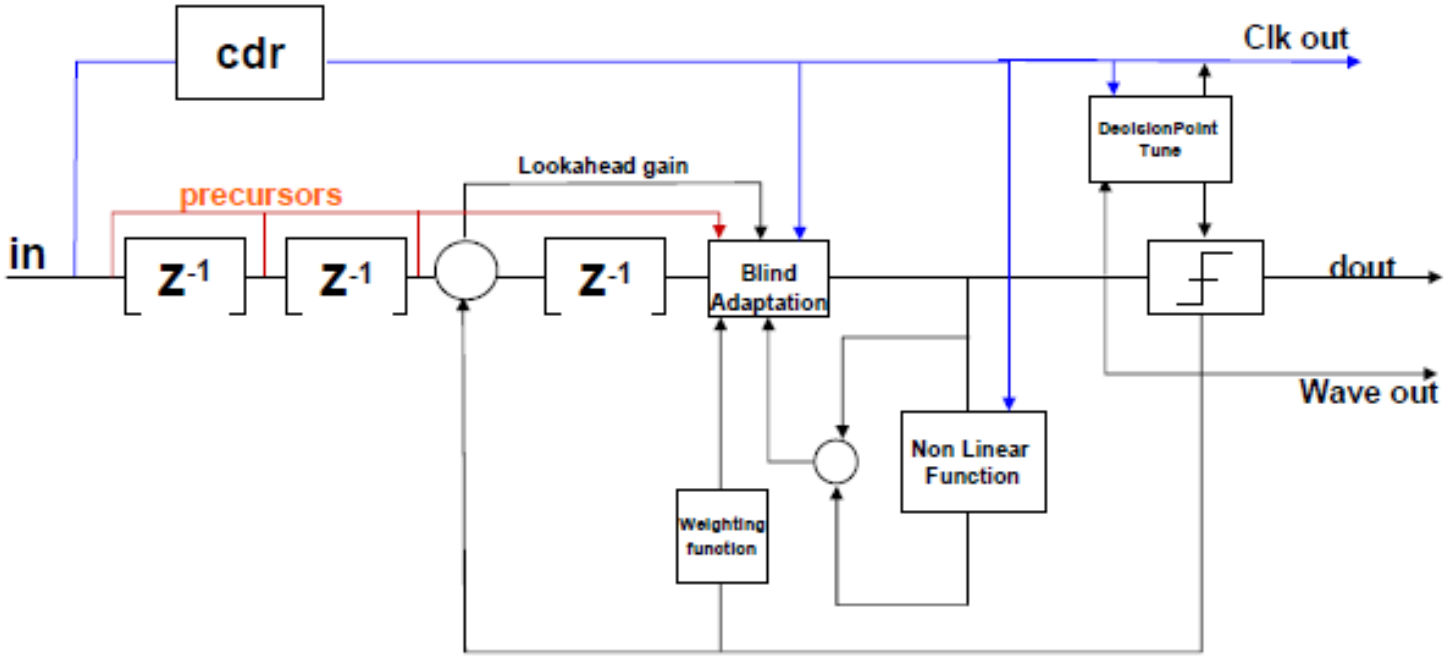
Sample Rx AMI Model Using GetWave



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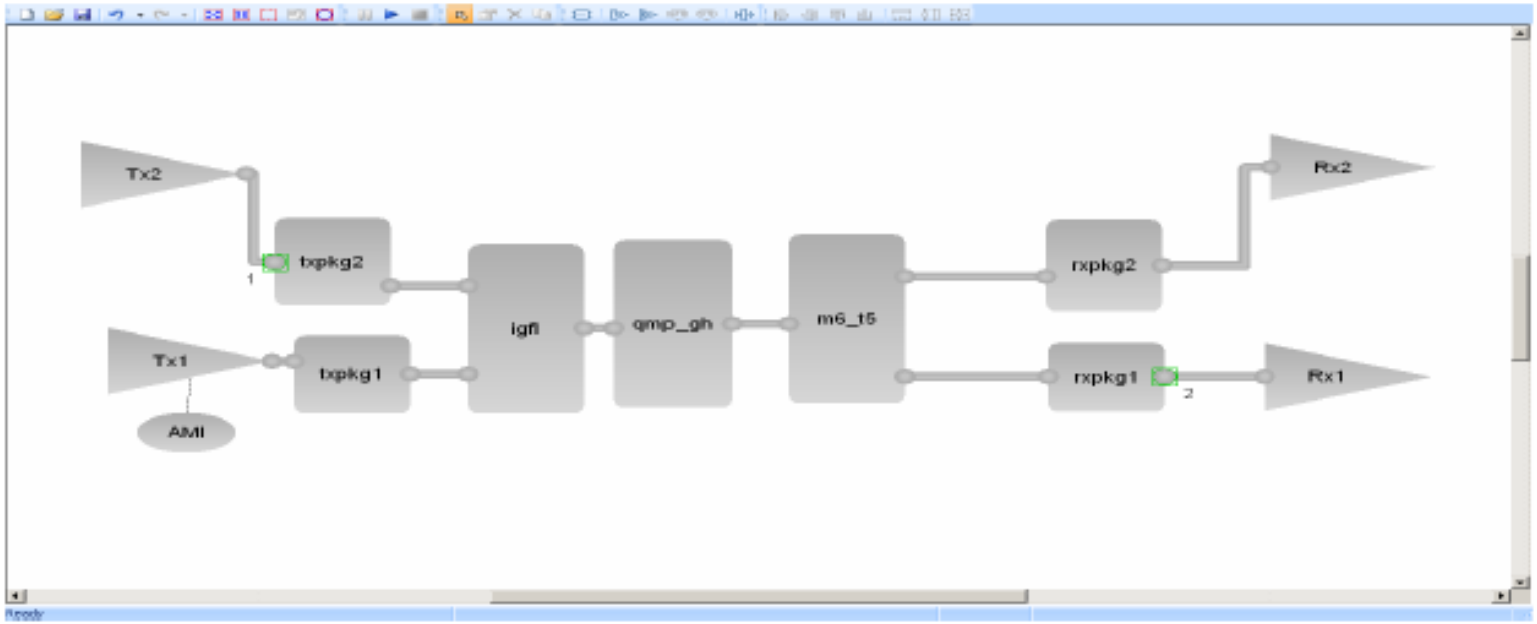
Statistical Analysis vs. Time Domain Analysis

- Case 1:
  - LTI system, Tx FFE filter, Ideal CDR at Rx
    - No transmit jitter



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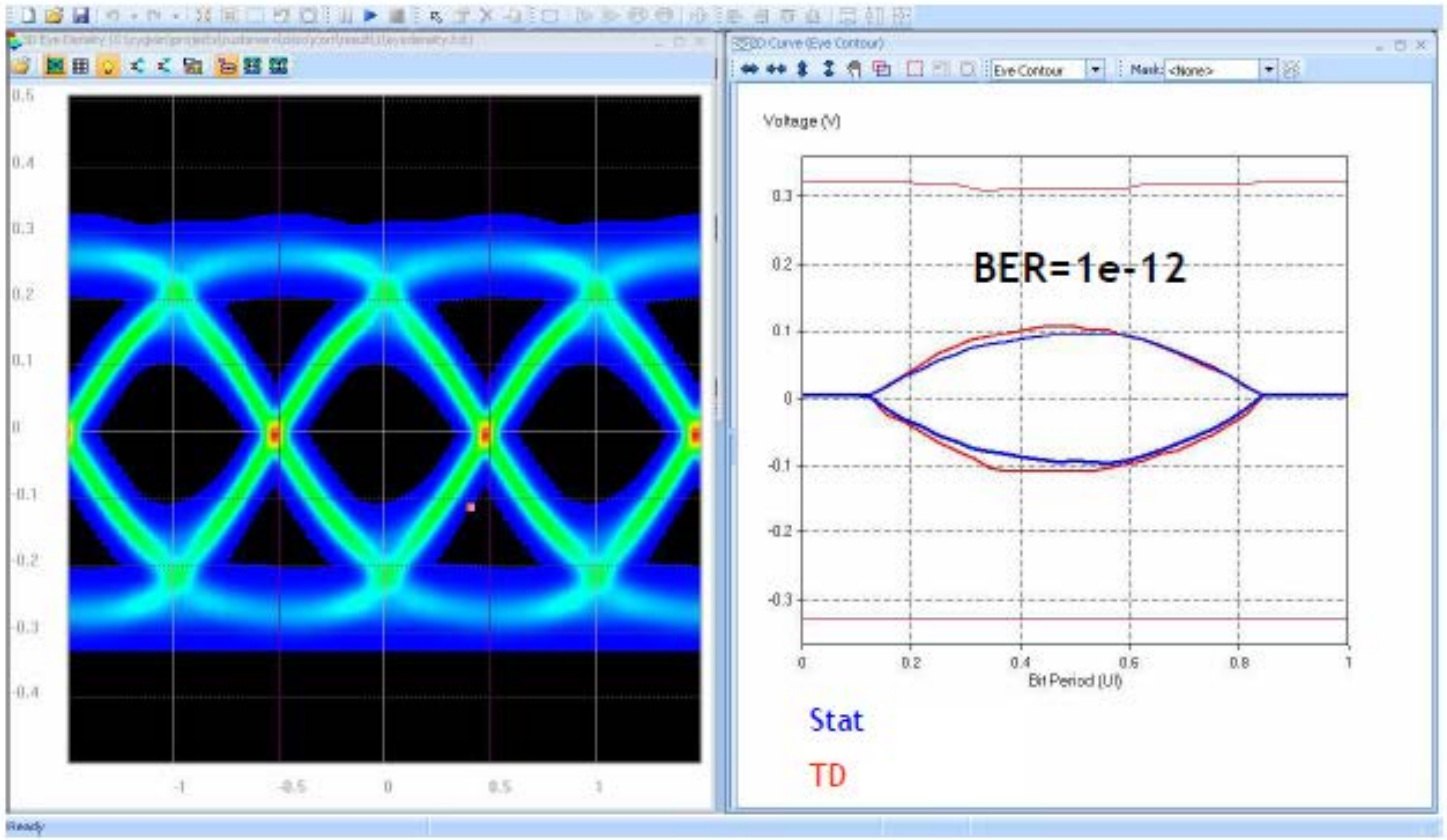
Case 1: Results



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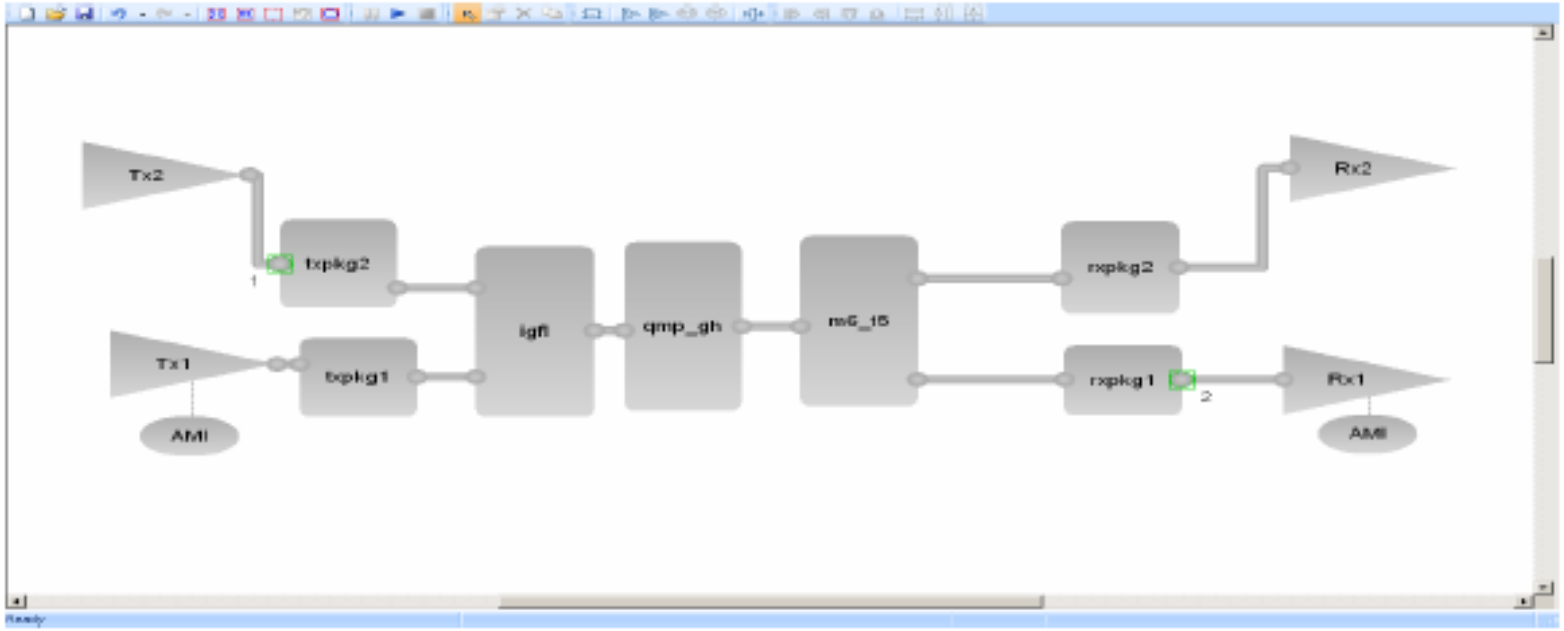
Statistical Analysis vs. Time Domain Analysis

- Case 2:
  - LTI system, Tx FFE filter, Real CDR at Rx, DFE Off
    - Tx jitter, Rx jitter, and frequency offsets



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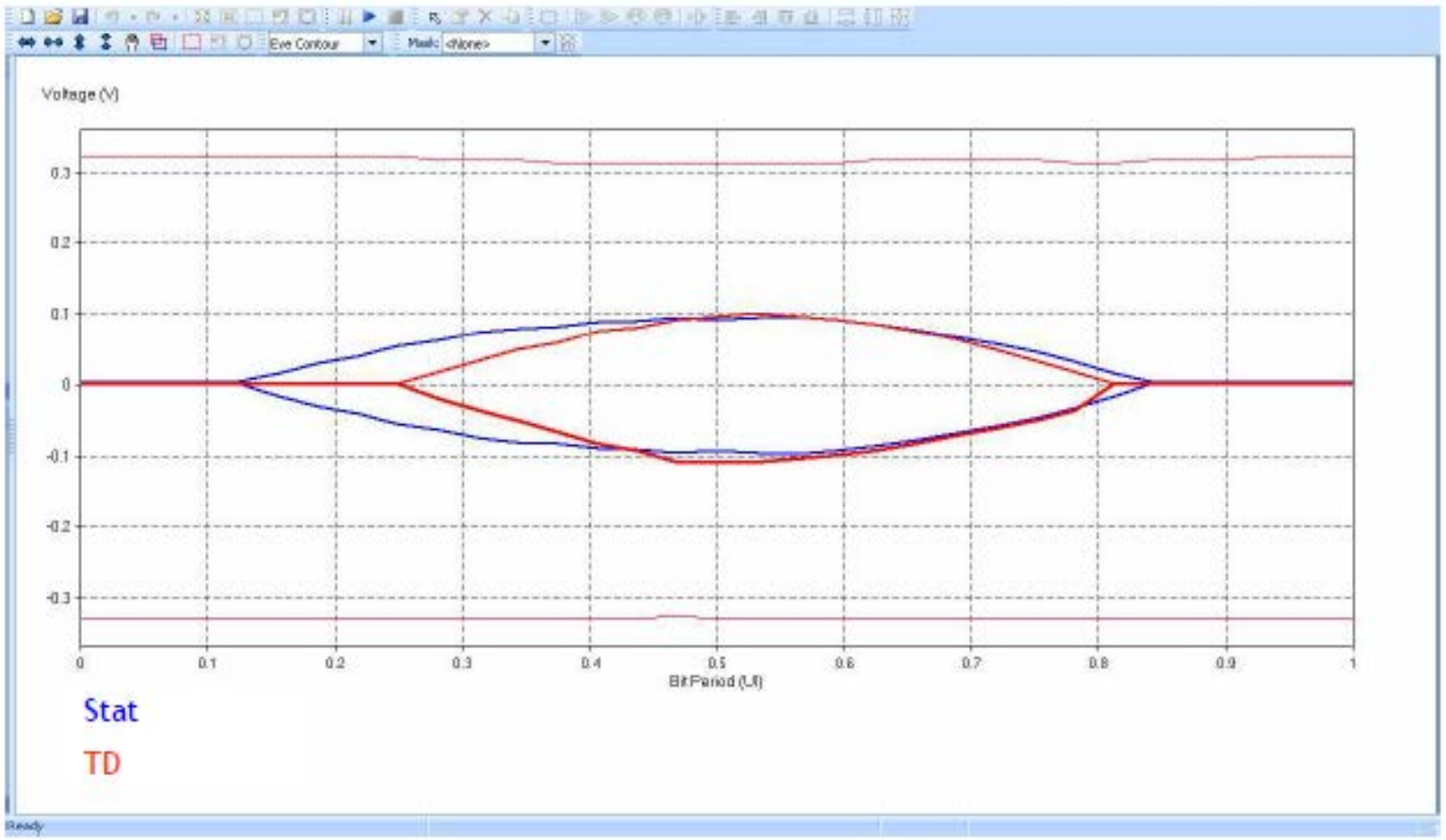
Case 2: Results



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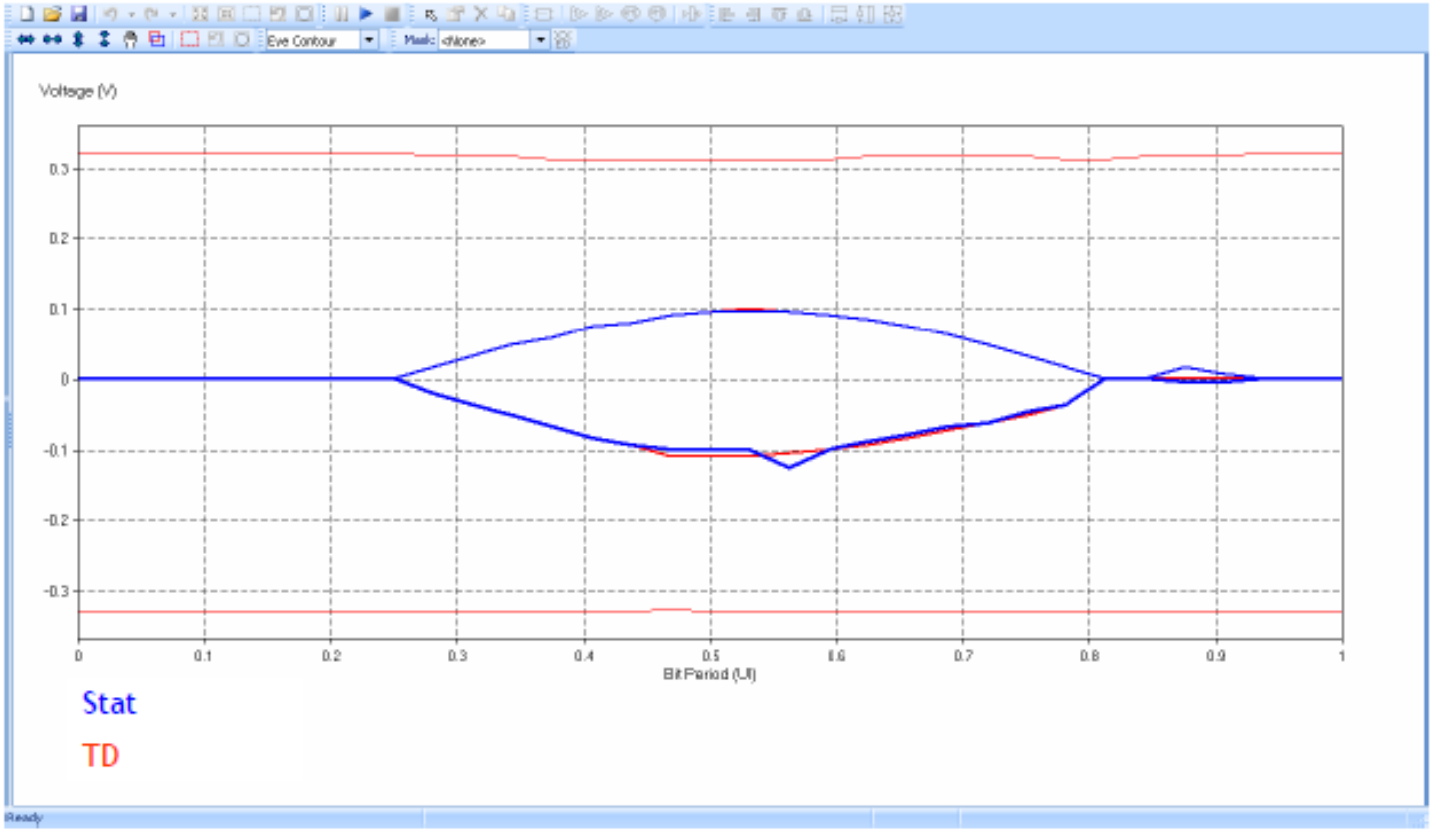
Case 2: Results with Modified Statistical Analysis



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Summary

- For LTI models, both Statistical and Time Domain Analyses can be fully supported
- For non-LTI models, direct Statistical Analysis ***cannot*** be generally supported

- ***AMI models using AMI_GetWave call are incompatible with purely Statistical techniques***

- Our recommendation is for non-LTI models to use Time Domain analysis

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