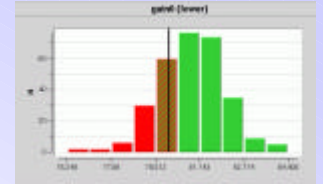
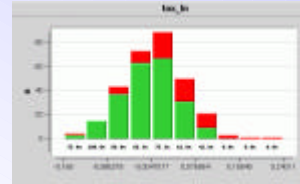


## Design for Manufacturability

### Process Variation & Tolerance Analysis

Component	Value	Unit	Min	Max	Yield (%)
gain	100	dB	99.999	100.001	100.000
gm	1.0	mA/V	0.999	1.001	100.000
phi	90	deg	89.999	90.001	100.000
band	1.0	MHz	0.999	1.001	100.000
band	1.0	MHz	0.999	1.001	100.000
gm	100	mA/V	99.999	100.001	100.000
power	1.0	W	0.999	1.001	100.000



Component	Yield (%)	Yield (%)	Yield (%)
Total Yield	100.000000 %	100.000000 %	100.000000 %
gain (linear)	100.000000 %	100.000000 %	100.000000 %
gm (linear)	100.000000 %	100.000000 %	100.000000 %
phi (linear)	100.000000 %	100.000000 %	100.000000 %
band (linear)	100.000000 %	100.000000 %	100.000000 %
gm (linear)	100.000000 %	100.000000 %	100.000000 %
power (linear)	100.000000 %	100.000000 %	100.000000 %

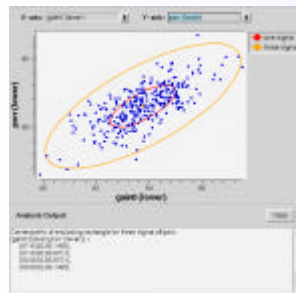
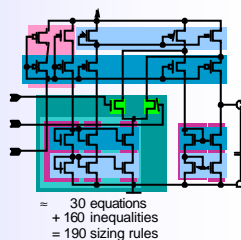
- Worst-case analysis and yield analysis are successfully applied to
- ✓ Very robust mixed-signal circuits
  - ✓ Memory devices
  - ✓ Cell characterization
  - ✓ Parametric yield improvement
  - ✓ Mismatch-sensitive circuits

#### Features

- ✓ Yield estimation including operating conditions (e.g. Temp., Vdd)
- ✓ Performance distributions
- ✓ Margin distributions
- ✓ Parameter influence analysis
- ✓ Parallel simulation on multiple hosts
- ✓ Flexible data export

### Structural Constraints & Feasibility

Constraint	Value	Unit	Min	Max
gain	100	dB	99.999	100.001
gm	1.0	mA/V	0.999	1.001
phi	90	deg	89.999	90.001
band	1.0	MHz	0.999	1.001
gm	100	mA/V	99.999	100.001
power	1.0	W	0.999	1.001



Component	Value	Unit	Min	Max
gain	100.000000	dB	99.999999	100.000001
gm	1.000000	mA/V	0.999999	1.000001
phi	90.000000	deg	89.999999	90.000001
band	1.000000	MHz	0.999999	1.000001
gm	100.000000	mA/V	99.999999	100.000001
power	1.000000	W	0.999999	1.000001

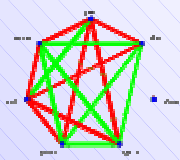
Monte Carlo analysis is productively applied to

- ✓ Yield and mismatch analysis for bandgaps, operational amplifiers, comparators
- ✓ Large circuits with up to 3000 parameters
- ✓ Simulation of extracted view (post-layout)
- ✓ Validation of statistical SPICE models

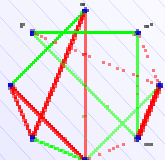
**Structural constraints** are for example transistor saturation or matching constraints.

- necessary for technically useful designs
- automatically generated ⇒ ease of use
- validated in manual design
- guaranteed in automatic design

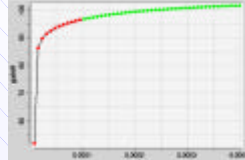
### Nominal Design & Design Centering: manually and/or automatically



Performance dependency



Parameter redundancy



Parameter Sweep

Component	Value	Unit	Min	Max
gain	100.000000	dB	99.999999	100.000001
gm	1.000000	mA/V	0.999999	1.000001
phi	90.000000	deg	89.999999	90.000001
band	1.000000	MHz	0.999999	1.000001
gm	100.000000	mA/V	99.999999	100.000001
power	1.000000	W	0.999999	1.000001

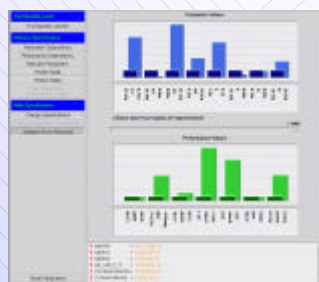
Automatic nominal optimization

Advanced analysis features make **interactive sizing much faster and less error-prone**.

For automatic sizing, four local and global **optimization engines** are included.

- Applied successfully to
- ✓ Operational amplifiers
  - ✓ Analog signal processing
  - ✓ I/O, digital library cells

- For
- ✓ Manual sizing
  - ✓ Automatic sizing
  - ✓ Yield improvement
  - ✓ Compensation of parasitics in extracted view (post-layout)



Nominal diagnosis

