

Missing EDA Links

SMASH your bugs!

Virtual characterization
for improving
design yield

DOLPHIN INTEGRATION

Eradicate design defects and weaknesses causing yield drops

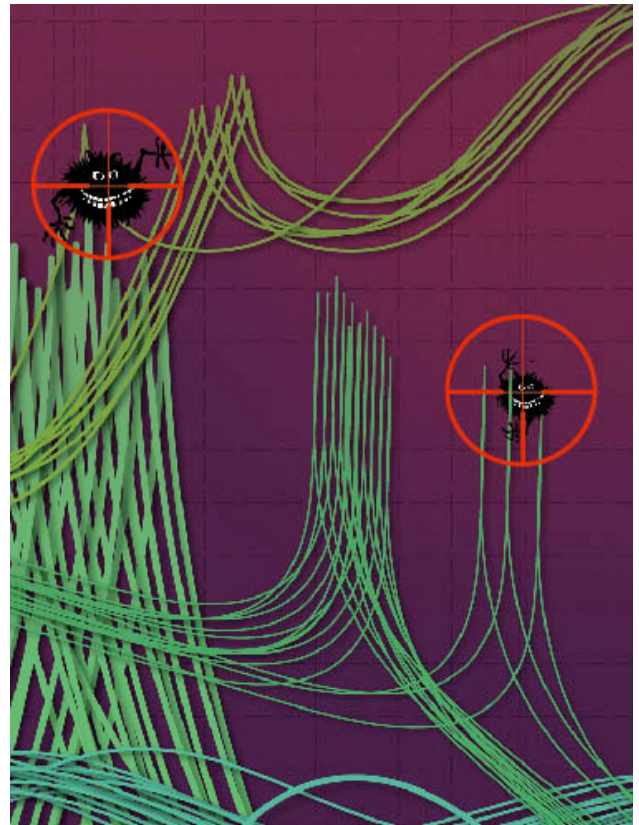
Design methods and EDA solutions must ensure that design is not the cause of yield drops during fabrication. Traditional approaches are based on worst case analysis which result in adding margins, thus increasing area or reducing performances.

Recent technological processes have made this approach obsolete as electrical and topological dispersions become paramount: worst case design is no longer acceptable! Traditional simulations do not provide the appropriate functionalities needed to address this challenge.

With SMASH, benefit from an arsenal of innovative features to win the war against design failures!

KEY BENEFITS

- ✓ Guarantee of design robustness with respect to statistical parameter variations
- ✓ Accelerated diagnostic of yield losses in fabrication
- ✓ Flexible integration of electrical or topological variations from foundry data
- ✓ Automatic detection of "**Multiple Operating-Points**" to ensure design operation for all bias points
- ✓ "**Sensitivity Locate**" to identify the contribution of each device to on-chip dispersion
- ✓ "**Imbalance Locate**" to diagnose design yield losses due to process dispersion
- ✓ "**High Impedance Nets**" detection to avoid mal-functioning circuits, yield losses, excessive leakage power...
- ✓ Fast and easy setup of HDL and HDL-AMS source code debug and coverage analysis



Don't miss your real target!

- Save your Silicon
- Improve your design yield
- Reduce your Time-to-Market

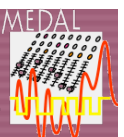
Do not wait any longer to download **SMASH Discovery** at
http://www.dolphin.fr/medal/smash/smash_download.php

Free tutorials will guide you through the discovery of its unique features!



SMASH is available identically under Linux and Windows.

dolphin-integration.com/eda
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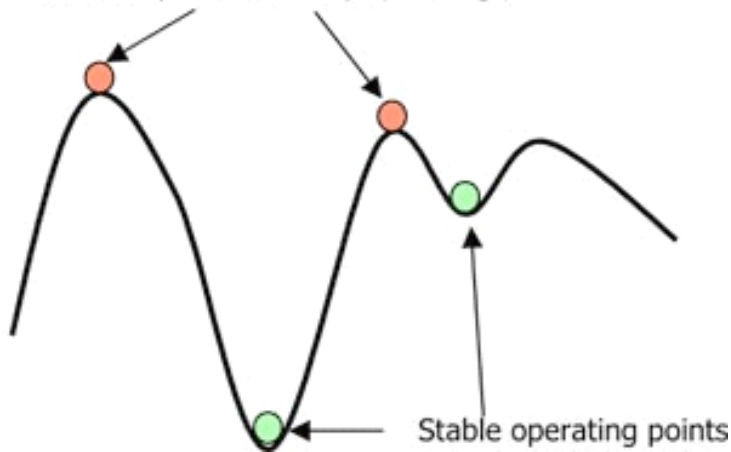
Design weakness identification for avoiding mal-functioning circuits

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Multiple operating-point detection

SMASH proposes the capability to search for multiple operating-points! It can automatically find multiple (in most cases all) bias conditions of a circuit.

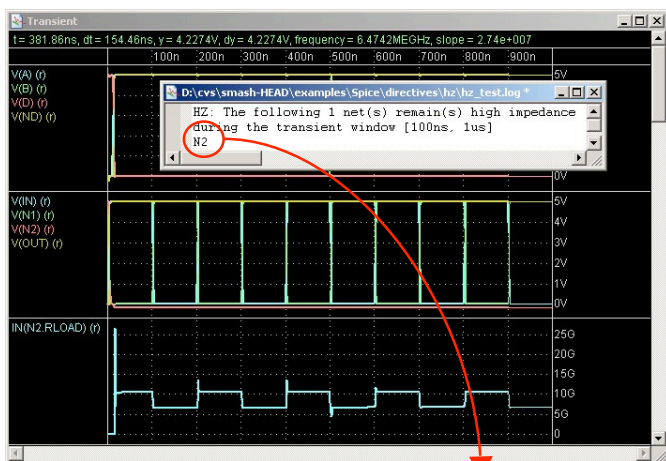
Metastable (limit unstable) operating points



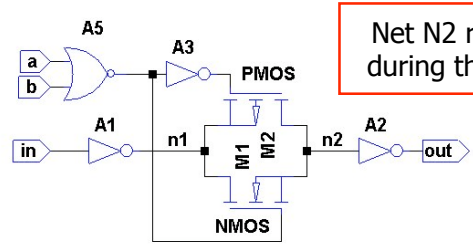
With the operating-point analysis, SMASH proceeds through a complete search, using all heuristics in sequence, and gives the first operating-point that is found. With multiple operating-point analysis, SMASH helps the designer **to determine whether there are several operating-points and to identify meaningful ones in order to simplify eradicating unwanted bias conditions** which render the circuit useless when self-biased in such operating conditions!

Typical applications: detect initialization cases of memorizing elements, verify that a cell always starts in the expected configuration, verify power configuration when starting...

Hi-Z Nets Detection



Net N2 remains Hi-Z during the simulation



Hi-Z, also known as high impedance, tri-stated, or floating, is the state of a net or output terminal which is not currently driven by the circuit. High impedance nets are useful when used appropriately, for example when large voltage gain must be obtained without large current consumption. However, unintentional high impedance nets are a frequent cause of non-working circuits, while practically undetectable with functional simulations.

SMASH provides an automated impedance analysis that identifies potentially crippling high impedance nets based on a designer specified threshold during transient simulation.

SMASH extends functional simulation to include an analog net "coverage like" analysis allowing analyzing impedance variation, measuring capacitive and resistive net impedances and detecting high impedance nets.

 SMASH is available identically under Linux and Windows.



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Dispersion analyses for anticipating fabrication defects

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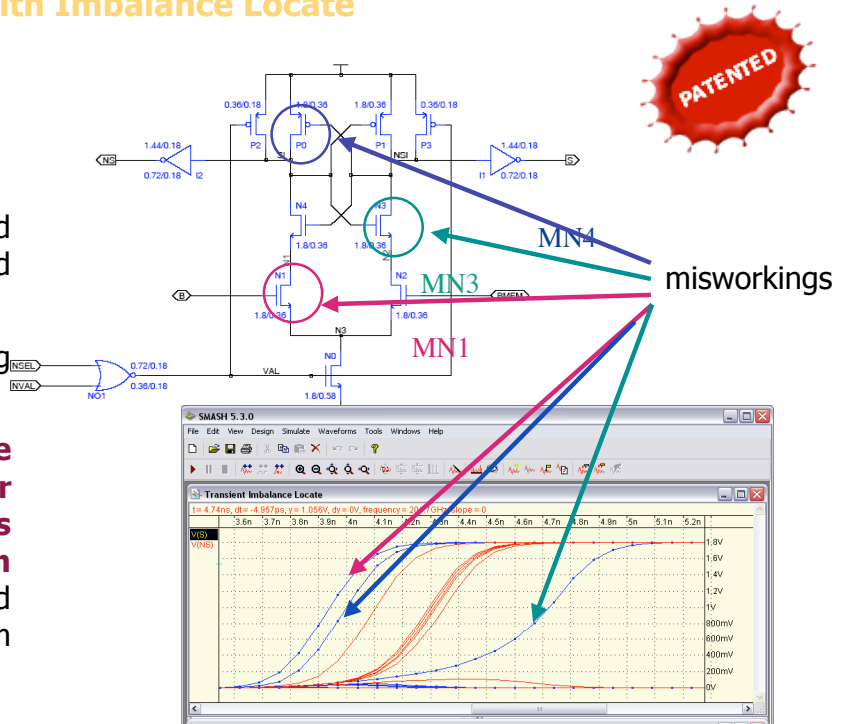
Automatic diagnostic of error cases with Imbalance Locate

Need help exploiting Monte Carlo results?

SMASH enables thorough diagnostic of yield losses due to dispersion of devices and precise pinpointing of disturbing ones!

It identifies the error cases in a circuit using classic Monte Carlo.

The patented extension, called **"Imbalance locate"**, goes beyond Monte Carlo for detecting which transistors, resistors or capacitors are sensitive to random dispersions such as mismatch effects and thus gives the opportunity to optimize them and increase circuit robustness.

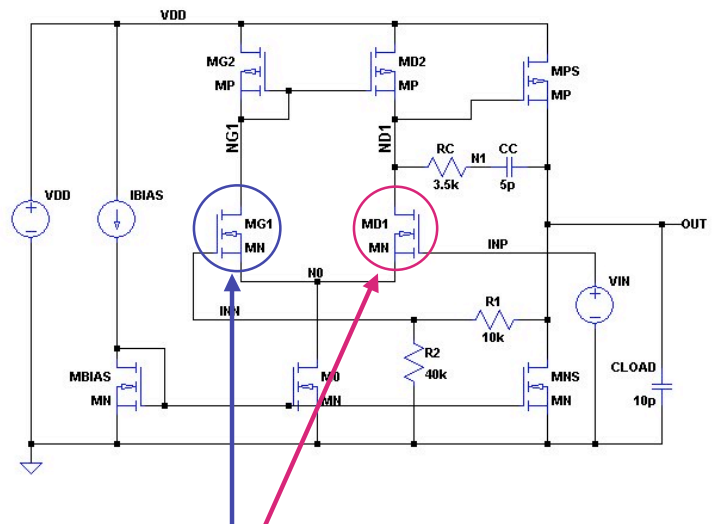


Locate Sensitivity to on-chip dispersion

Can't afford Monte Carlo for circuit reliability analysis?

"On-Chip dispersion", also called local dispersion, is defined as variations of characteristics between two identical devices, inside the same chip, after fabrication. It results in random differences in their electrical characteristics causing mismatch.

SMASH delivers a specific extension and algorithm called **"Sensitivity Locate"** for diagnostic of component contribution to dispersion, thousands of times faster than Monte Carlo analysis!

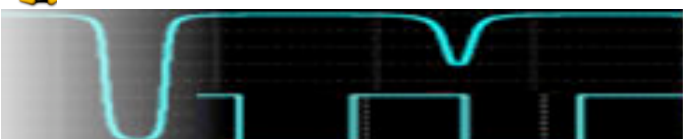
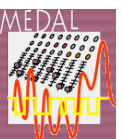


Mismatch sensitive devices

- ✓ Identify them
- ✓ Quantify the risk
- ✓ Act on it
- ✓ No Monte Carlo needed!

SMASH is available identically under Linux and Windows.

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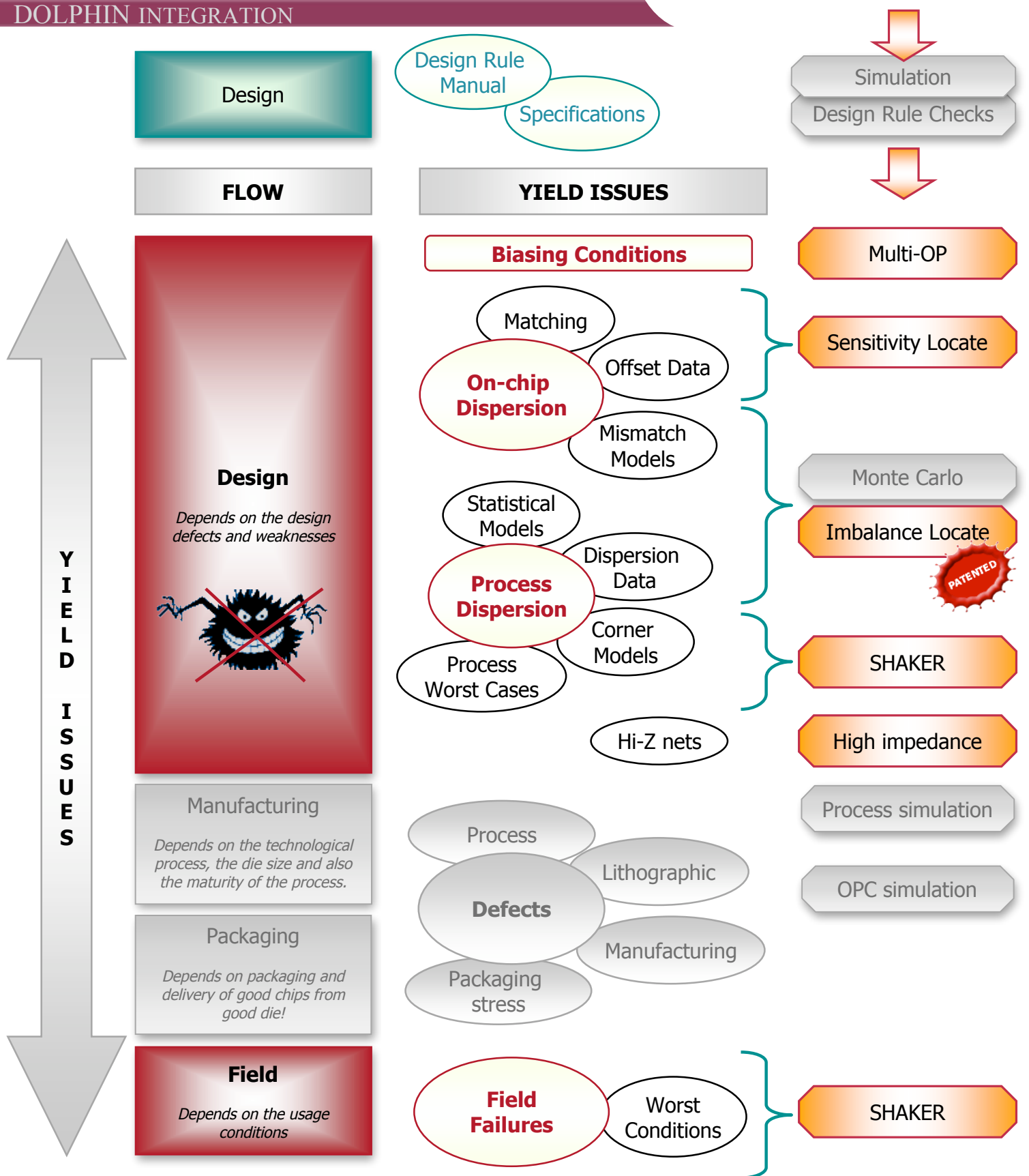


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Methodology of Design-for-Yield for increasing robustness



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