May 18, 2016

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Berkeley, MIT, Purdue, Stanford

Xufeng Wang
Purdue University

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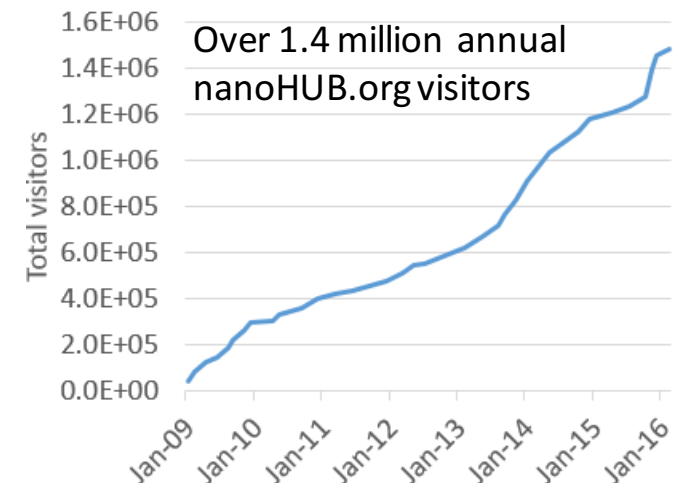
Leveraging nanoHUB

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Publishing compact model with NEEDS

Description	Content
Title	Source code
Version	Circuit simulation benchmark
Synopsis	Parameter sets/extractor
Abstract	Manual
References	Other files
NEEDS Modified CMC License	
Authors	
Tags	

Individual compact model page

NEEDS list of compact models

Publishing compact model with NEEDS

Version control and access

Versions				
Version	Released	DOI Handle	Status	
1.1.1	Dec 02, 2015	10.4231/D3RR1PN6M	published	view version »
1.1.0	Aug 01, 2015	10.4231/D3QZ22J40	published	view version »
1.0.1	Oct 23, 2014	10.4231/D3H12V82S	published	view version »

Wishlist

Wishlist

⊕ Add a new wish

Recent Wishes (view all 1)

Questions

Recent Questions

⊕ Ask a question

Recent Questions (1)

💬 Extracting parameters from MVS model

Citations

Citations Non-affiliated (0) | Affiliated (1)

Affiliated authors

S. Eryilmaz; Duygu Kuzum; Shimeng Yu; H.-S.P. Wong (2015), Volatile-Memory Based Neuromorphic Architectures," *Electro*

Update tracking

Double-Clamped Silicon NEMS Resonators Model

This model is built for a silicon-based, double-clamped (sou capacitive modulation with the two gates, piezoresistive mo

🔴 Subscribe to this compact model update/news

Upcoming features:
- Bug report
- Detailed user usage

Compact model publication platform

1. Start by initiating a project.
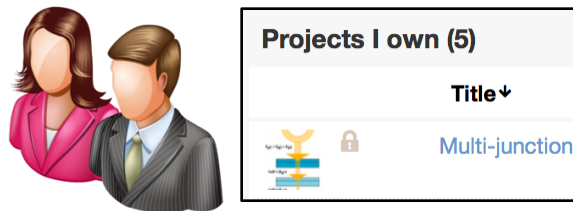
2. Build a CM publication

Automatic background VALint check and onscreen feedback to the author

✓Description ✓Content ✓Authors ✓Extras ✓Tags ✓License ✓Notes

Submit

Reject
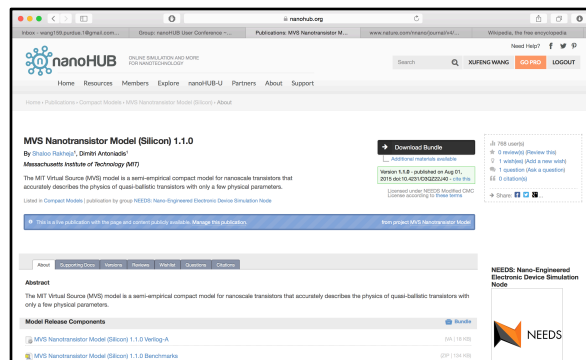
3. Review by NEEDS curator

Verilog-A Source Code

updated Jul 03, 201

4. Publish on nanoHUB
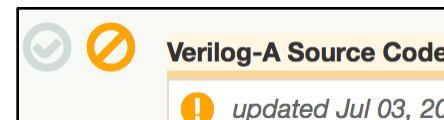
approve

VALint

CMC Recommended Practices

C. McAndrew, et al., "Best Practices for Compact Modeling in Verilog-A", Journal of Electron Device Society (2015)

NEEDS license checking

compiling errors checking

Check   Edit

Pretty printing

VALint development

Prototype: VAChecker 0.1 (late 2014)
- Based on ADMS
- Check for single Verilog-A file only.
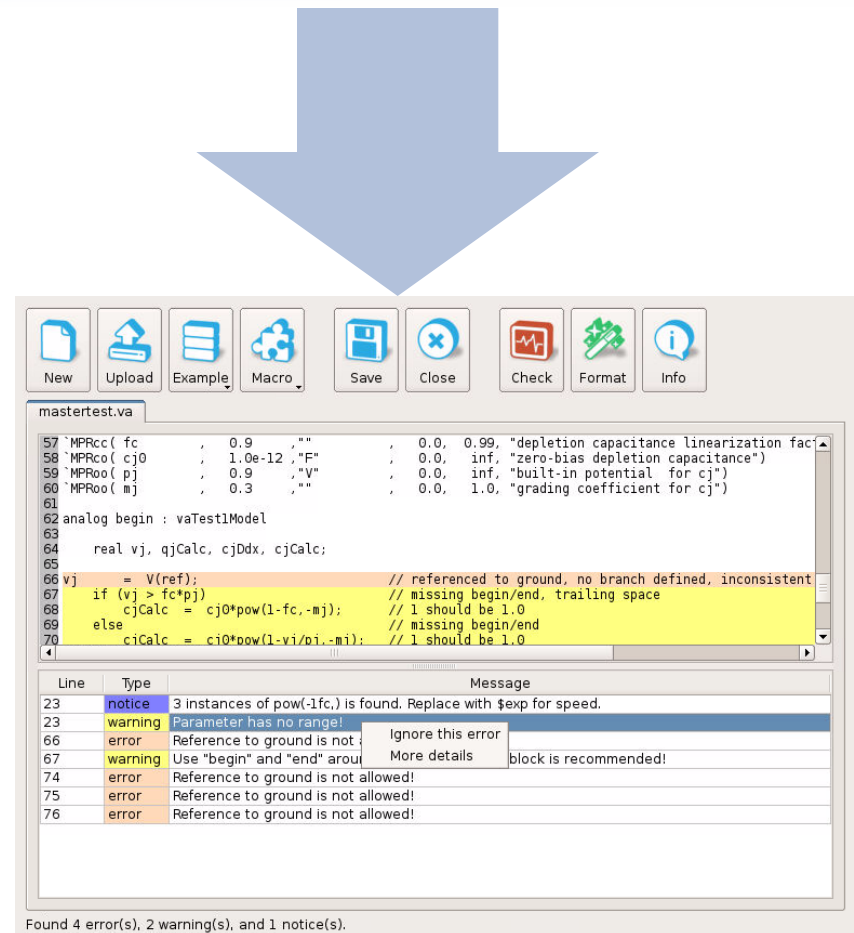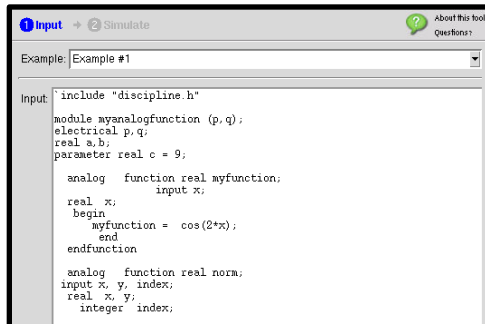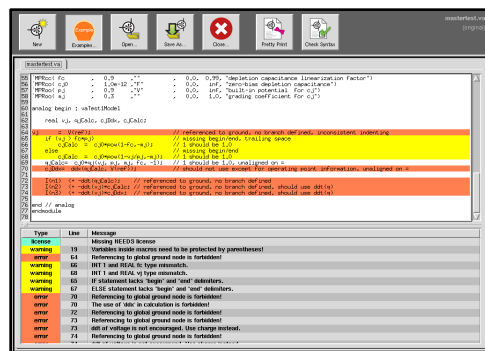- Simple text based output

VALint BETA 0.2 (since Sep. 1st, 2015)
- Support models with multiple Verilog-A files.
- Text editor interface with VALint integrated.
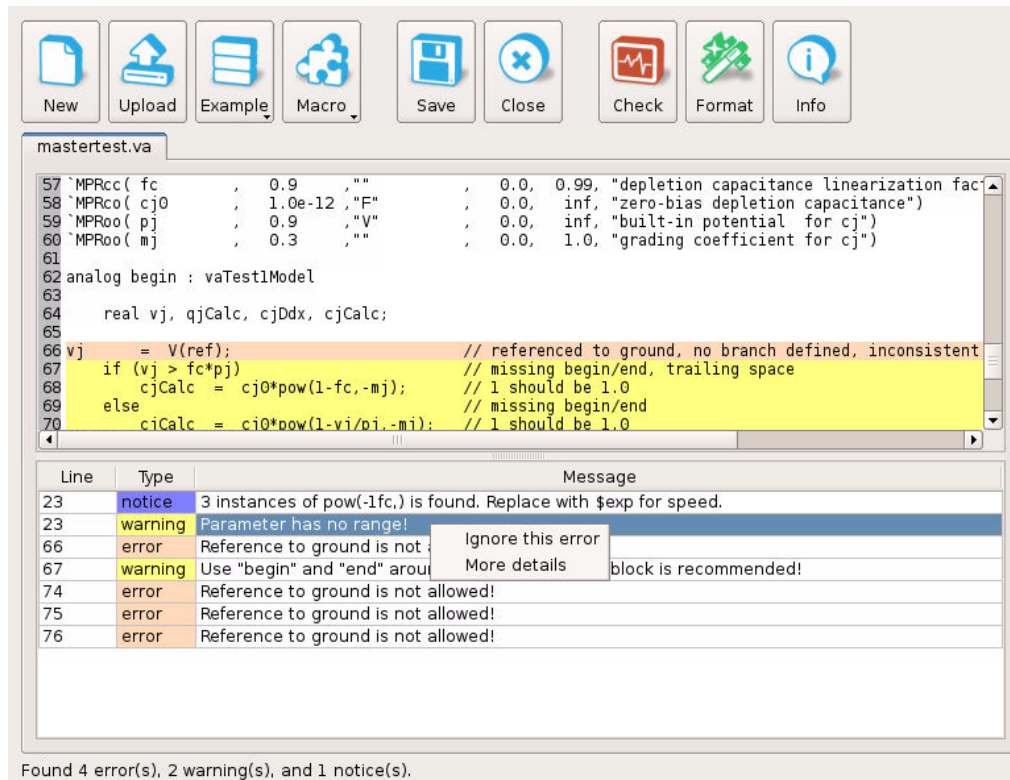- To be an integrated part of NEEDS publication curation.

Feedback:
- Unable to upload proprietary compact models to nanoHUB
- Difficult to install because ADMS depend on legacy software
- Many missing rules/recommended practices that are not supported by ADMS

VALint BETA 0.3
(since April 18th, 2016)

VALint development

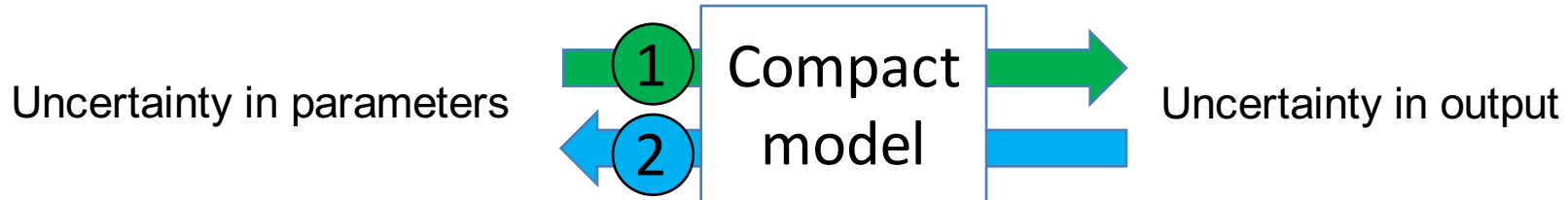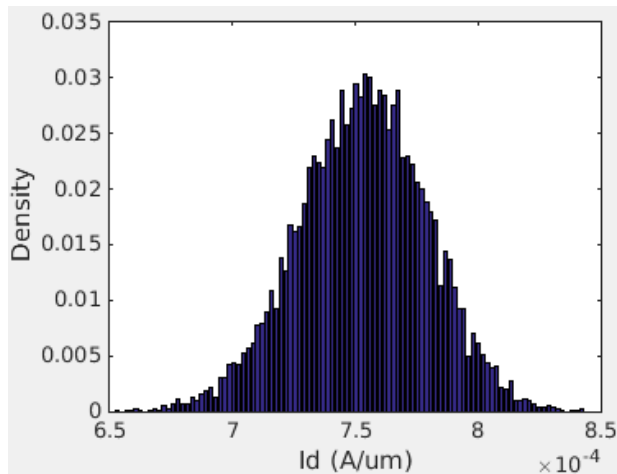VALint BETA 0.3 (since April 18th, 2016)   https://nanohub.org/tools/vachecker
- Complete rewrite based on
  - VAPP engine developed by Berkeley team
  - Qt based interface
- Octave compatible.
- Addressed many issues reported in version 0.2

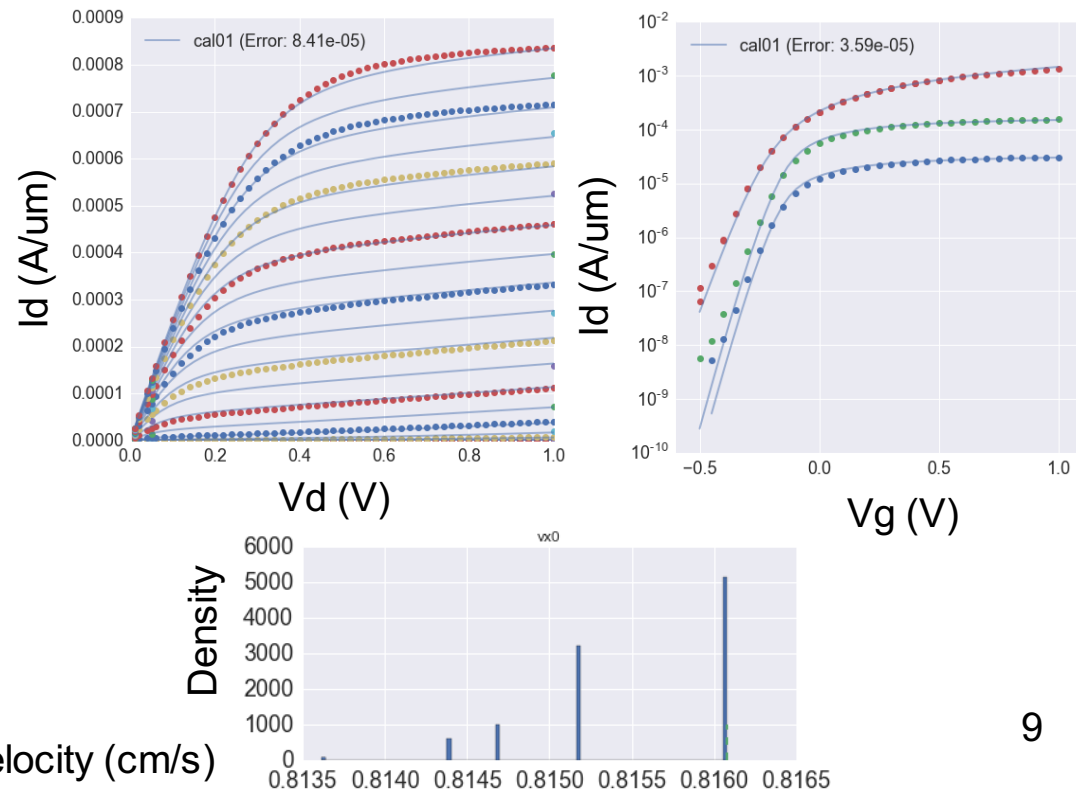# Uncertainty quantification with compact models

Uncertainty in parameters ① Compact model ② Uncertainty in output

① Uncertainty propagation

② Parameter fitting with uncertainties

Adapting UQ developed by PRISM program at Purdue for compact models

Summary

- VALint

  - Industrial strength models

  - Cross platform installation scripts

- Model exerciser

  - MAPP

- Uncertainty quantification

- Model deployment and curation