S2IBIS
Past, Present and Future

IBIS SUMMIT
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Outline

• Background
  – s2ibis1, s2ibis2
  – Darpa Project ‘NeoCad’

• s2ibis3
  – Features
  – Keyword coverage
  – Tool flow

• Future Work
  – Adding more features to s2ibis3
  – Macromodeling
  – Noise issues (SSN)

• Conclusion
Background

• s2ibis1 and s2ibis2

• Darpa Project ‘NeoCad’

Automated Design Tools for Integrated Mixed Signal Microsystems (NeoCAD)
s2ibis3

• **Features**
  
  – Backward compatible
    • Same program runs on Windows, Unix, Linux
  
  – Convergence issue with hspice
    • Involves user to enter desired range
    • Feedback needed for other simulators
  
  – Java ONLY
    • No Lex, Yacc for parsing
    • Platform independent
• **Keyword Coverage**
  – [Series Mosfet] and all the related keywords.
    • [series pin mapping]
    • [series switch groups]

```plaintext
[model] SwitchModelTest
[model type] series_switch
[c_comp] 0pf
[on]
[series_mosfet]
[vds] 1.0
[vds] 2.0
[vds] 3.0
[vds] 4.0
[off]
[R series] 1M 1M 1M
```
..s2ibis3

- Tool flow

**S2IBIS Command File**
- Header information
- Component Description

**Parser**
- Parses all relevant information from Command file

**S2IBIS**
- Calls Spice, analyzes data
- Prints results

**SPICE**
- Performs simulations with HSPICE, PSPICE, SPICE2, SPICE3, SPECTRE

**IBIS Model**

Circuit Layout
..s2ibis3

• Available for download at
  • http://www.ece.ncsu.edu/erl/ibis/s2ibis3/s2ibis3.htm

• BETA version available currently.
• JDK 1.4.1 needed to run s2ibis3.
• Feedback is needed to improve tool.
## s2ibis2 V s2ibis3

<table>
<thead>
<tr>
<th>s2ibis2</th>
<th>s2ibis3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ver 2.1 and 1.0</td>
<td>Ver 3.2, 2.1 and 1.0</td>
</tr>
<tr>
<td>GUI hard to implement</td>
<td>GUI next step</td>
</tr>
<tr>
<td>Not portable</td>
<td>Portable easily</td>
</tr>
<tr>
<td>C, Lex, Yacc</td>
<td>Java</td>
</tr>
<tr>
<td>Uses a command file</td>
<td>Uses s2ibis2 like command file</td>
</tr>
<tr>
<td>Runs multiple spice simulations from within program</td>
<td>Runs multiple spice simulations from within program</td>
</tr>
</tbody>
</table>
Future Work

• More features to s2ibis3
  – GUI to plot graphs
  – Parser integration for automatic validation of the output IBIS files
  – Project manager for file and library maintenance.
  – More Flexibility
    • define sweep range
    • choose between TYP, MIN and MAX process corners
..Future

- Macromodeling
..Future

- Noise Issues

![Noise in quite line](image-url)
Conclusion

• **Completed s2ibis3**
  – Awaiting response from users

• **Intend to validate research work with industry collaborators**
  – Noise issues
  – Macromodeling

• **Test accuracy of models**
  – Against simulations
  – Against measurements