

Next Generation MOSFET Model

May 25, 2005

The CMC is in the process of selecting a new standard MOSFET Model. Initially developers of six MOSFET models were invited to present at the June 2004 CMC meeting (these models were ACM, BSIM5, EKV, HiSIM, MOS Model 11, and SP). At that meeting it was announced by the developers of MOS Model 11 and SP that they would merge these models and collaborate on a single model, called PSP.

Of these five models, four were sponsored by a CMC member company and were selected for detailed study; these were BSIM5, EKV, HiSIM and PSP. The CMC provided IV, capacitance, and S-parameter data sets for 90nm NMOS and PMOS FETs and parameters were extracted for each of the four models to fit these data sets. In addition to the comparison of each model to the measured data sets, a set of qualitative tests was applied to each model. The results of these evaluations were presented at the March 2005 CMC meeting. After this meeting the CMC member companies voted by e-mail ballot to select two models for further evaluation by CMC member companies. The finalists are HiSIM and PSP.

CMC member companies are now in the process of comparing these two models using their own MOSFET devices and circuits. Results of these comparisons will be presented at the CMC meeting in October 2005. A single model will be selected for standardization by e-mail ballot after the October meeting.

The CMC will then fund a university to “standardize” the model. This will include fixing bugs or model weaknesses found during testing, providing documentation, and establishing procedures for tracking bugs and controlling code releases.

We expect that the new standard model will begin to be used in 2006. At that time the CMC will support three standard models for bulk MOSFETs; BSIM3, BSIM4 and whichever of the finalists is selected. More information is available on the CMC website <http://www.eigroup.org/cmc/>.