

“Behavioral modeling and implementation of SSA models with nonlinear memory effects in system level simulators”

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Abstract – Solid state amplifier (SSA) behavioral modeling is a hot research topic, with a tremendous amount of proposed models. A capital point in these behavioral modeling is the ease and accuracy of model parameter extraction process along with the model run time efficiency in system level simulation tools. This work extends previous works and investigates an efficient approach to characterize and reproduce Long-Term Memory (LTM) effects, using first order dynamic Volterra feedforward combination. A straightforward and systematic model extraction procedure, based on single and two-tone measurements, is given as well as a model implementation technique in system level simulation environments. This extraction can be easily carried out using conventional harmonic balance simulation or frequency-domain measurements. Its validation is demonstrated through MATLAB / SIMULINK simulation comparison. The proposed model with the novel extraction method improves efficiency in terms of accuracy and simulation speed.