

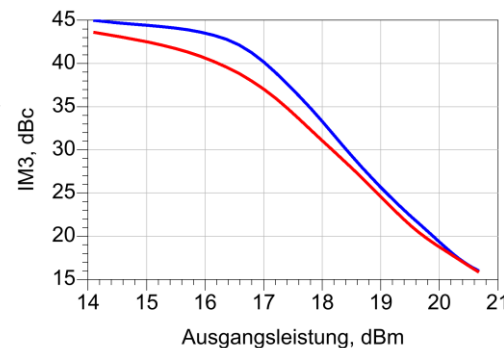
Modelling and Simulation of Nonlinear Power Amplifier Behavior

Nonlinear and memory effects in RF power amplifiers significantly impact signals in modern communication systems. To judge the expected nonlinearity of an Amplifier during the design process two-tone simulations are used, as they have similar characteristics to modern modulations schemes. For more advanced amplifier configurations it is unclear how two-tones simulations relate to real signals. To study this behavioral models of the amplifier can be used to reduce computing demand.

The student will use a behavioral amplifier component provided in ADS to model a transistor core. Then modulation schemes will be applied to the model and the response studied.

Tasks:

- Understand the ADS provided model
- Extract needed parameters from provided core and compare model to layout
- Model different modulations and compare behavior to two tone simulations



$$\begin{aligned}
 y(t) = & h_0 \\
 & + \int h_1(\tau_1) x(t - \tau_1) d\tau_1 \\
 & + \iint h_2(\tau_1, \tau_2) x(t - \tau_1) x(t - \tau_2) d\tau_1 d\tau_2 \\
 & + \dots
 \end{aligned}$$

Requirements:

- Good understanding of circuits
- Interest in modeling and Power Amplifiers

Language: English/German

Ansprechpartner

M.Sc. Simon Klimenko
Building 30.10 , Room 1.32
E-Mail: simon.klimenko@kit.edu

Prof. Dr.-Ing. Ahmet Cagri Ulusoy
Building 30.10 , Room 3.28
E-Mail: cagri.ulusoy@kit.edu