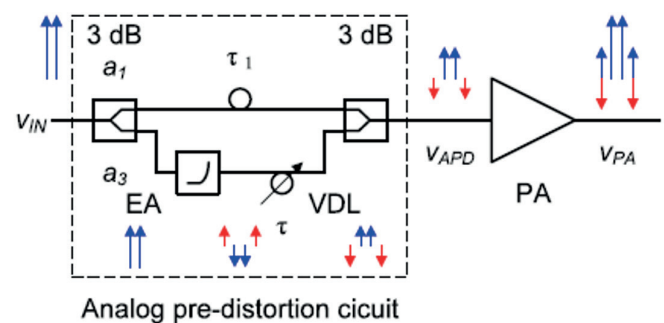


Master's thesis proposal

Design of an analog predistorter for linearization of mmW power amplifiers

Fraunhofer IAF is one of the world's leading research institutions in the field of III-V semiconductors and synthetic diamond developing technologies for use in communication, energy, mobility, industry and medicine. In our microelectronics department we are offering the following master's thesis:

Power amplifiers are driven with high input amplitudes, generate high output amplitudes and are therefore necessarily non-linear. However, nonlinear operation causes intermodulation distortions, which must be avoided in communication applications. One way to tackle this problem is linearization. Below 6 GHz, linearization of power amplifiers is often done in the digital domain as the channel bandwidth is in the MHz range, and FPGAs can generate signals "on the fly". As current digital platforms are too slow at mmW frequency bands, the linearization must be done in the analog domain.



Tasks to complete:

- Literature survey and characterization of an existing amplifier (e.g., at E-band, 71-76 GHz) for evaluation.
- Choice of a suitable predistorter concept and design of an integrated circuit. The goal is to achieve low DC power consumption and low insertion loss; the predistorter should not degrade the overall system efficiency when used with a watt-level power amplifier.
- Electromagnetic simulation and layout.

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