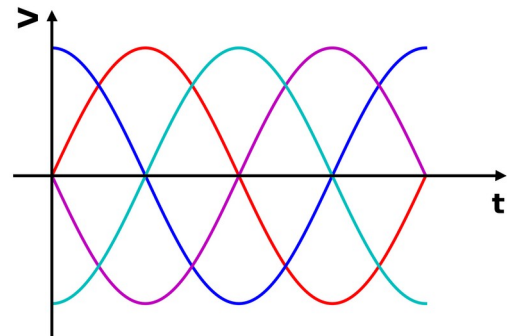


Master-Thesis

Sub-THz Quadrature Oscillators for High-Precision Sensing and Communication Applications

Quadrature format signals, also known as complex signals or I/Q signals, can carry more dimensions of information and provide more degrees of freedom in signal processing. They are widely used in various fields of electrical engineering, such as high-precision sensing and measurement systems, automotive radars, and communication systems. As a circuit block that can directly generate quadrature signals, quadrature local oscillators (LO) are at the forefront of research in the radio frequency, especially the Sub-THz field.



In this work, different quadrature oscillator topologies will be investigated and compared, then we will implement a quadrature oscillator design in the Sub-THz range for high-precision sensing and communication applications from schematic to layout based on 130 nm SiGe technology. In addition to circuit design, functional analysis, layout optimization, data processing, and result presentation are also central aspects of this master's thesis.

Requirements:

- Experience with CAD programs such as Virtuoso, ADS
- Knowledge of Python or MATLAB
- Good knowledge of English

After completing the work, there are good career prospects in the following areas:

- Communication System
- IC-Design

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