THz Schottky diode mixers for high resolution FIR spectroscopy

The aim of this project is to explore room temperature and broadband Schottky diode mixers for atmospheric sensing and for use in phase-locking of far infrared optical sources (e.g. quantum cascade laser). The main objective is to improve the spectral resolution of heterodyne instrumentation up to 4.7 THz for air/space borne applications. Schottky diode based sub-systems are therefore of strategic importance for submillimetre wave and FIR instruments dedicated to the study of the Earth’s atmosphere, and the study of planets and astrophysics.

With the overall objective in focus, the master thesis includes the following specific goals:

* Study mixer mixer topologies suitable for operation between 3-5 THz;
* Design of 3.5 THz mixer;
* Characterization of a Schottky diode harmonic mixers (x6) at 3.5 THz for phase-locking applications;

The content of the work will be defined by the project duration (30 or 60 credit points).

Suitable background: F or E, specialization within microwave and photonics engineering.

The project will be a part of the Chalmers GHz centre, a research collaboration with industry.

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