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PHD THESIS

Radio astronomy has witnessed unprecedented growth over the past few decades, allowing us to explore our galaxy and expand our knowledge about the origin of the universe. However, a part of the electromagnetic spectrum has remained unexplored due to technological limitations. The terahertz (THz) frequency range, referred to as the sub-millimetre or far-infrared region, is roughly defined from 300 GHz to 10 THz. It represents the area of the electromagnetic spectrum where microwave and optical techniques meet.

Studying the chemical composition of the Earth at THz frequencies will provide valuable insights into global warming and climate change. In particular, detecting gas species such as atomic oxygen (OI) at 4.7 THz and hydroxyl (OH) at 3.5 THz in the least explored atmospheric regions can improve the climate and weather prediction models.

A key component in receivers is a mixer or frequency converter. Mixers can detect and convert incoming signals to lower-frequency signals that are easier to process and analyse. This thesis focuses on developing mixers that operate at 3.5/4.7 THz based on Schottky diodes which are ideal for long lifetime space missions since they operate without cryogenics.

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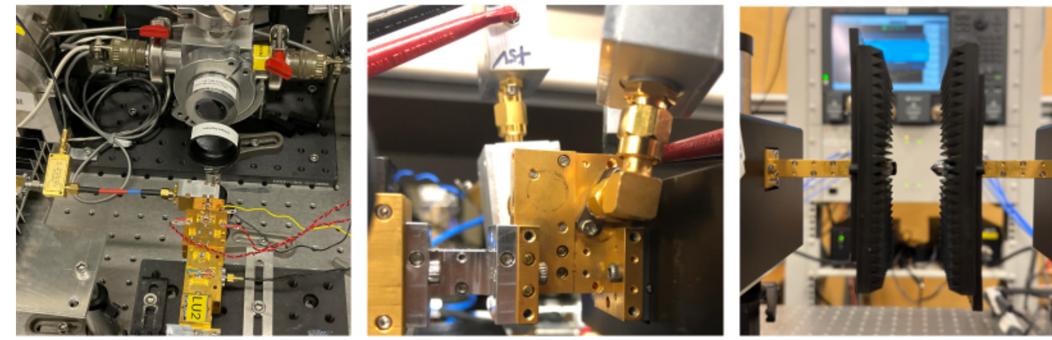
DIVYA JAYASANKAR • Design and Characterisation of Terahertz Schottky Barrier Diode Mixers • 2024



Design and Characterisation of Terahertz Schottky Barrier Diode Mixers

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