MIDAS

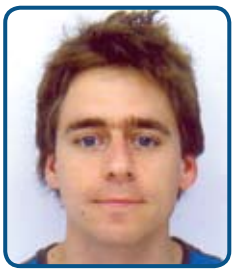
Millimetre-wave Integrated Diode and Amplifier Sources

HARVESTING THE FULL POTENTIAL OF RADIO WAVES

Invisible to the human eye, yet essential to all modern day communication, radio waves are all around us. However, Europe's ability to exploit very high radio frequencies is limited by technological constraints above 100 GHz. The project MIDAS addresses this shortfall.

Recognised to be of key scientific and commercial importance, exploitation of the upper Extremely High Frequency (EHF) spectrum (between 100 GHz and 1000 GHz) is paramount for further development of state-of-the-art satellites. In the field of commercial telecommunications or Earth observation, the upper EHF spectrum heralds increased satellite precision as regards measurements and data transmission capability. Therefore, Europe needs to develop its own technical capabilities to use this part of the spectrum, since its scientific and commercial exploitation constitute the seeds for subsequent harvesting of key scientific and technological potential generated within this frequency band.

The MIDAS project undertakes the development of a demonstrator source delivering enough power at 300 GHz for having direct commercial applications. In doing so, the project intends to build upon European amplifier technology when developing critical Schottky varactor diodes that may enable planned sub-millimetre wave space science and Earth observation instrumentation. These diodes are critical components in generating power above 100 GHz where the available power from other amplified sources significantly reduces.



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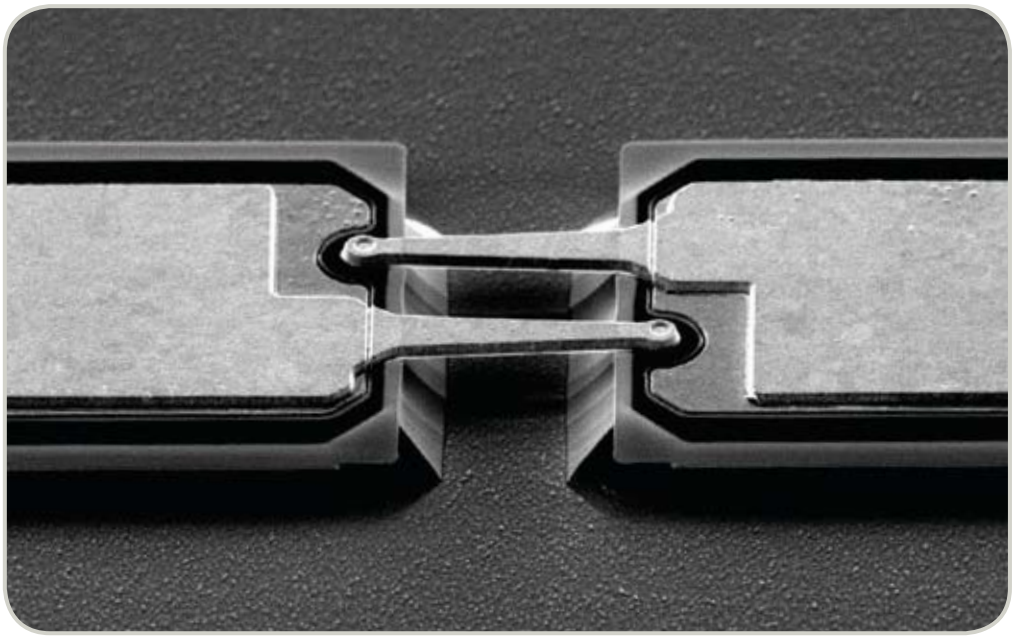

Air-bridged Schottky diode fabricated at STFC - Rutherford Appleton Laboratory. The bridge length is 16 microns. © STFC - Rutherford Appleton Laboratory

MIDAS enhances Europe's ability to exploit the sub-millimetre region of the electro-magnetic spectrum for the fabrication of a terahertz source, thereby addressing one of the most significant technological imbalances existing between the EU and third countries.

Questions & Answers

What do you want to achieve with this project?

This project will significantly enhance our ability design and fabricate high frequency circuits, enabling new applications to be realised. Europe will also become non-dependent on the US in this critical area of THz power generation.

Why is this project important for Europe?

This project will help Europe become more competitive in a range of emerging applications that require increasing levels of power in the THz region. The results of this project will be applied to applications in Earth observation and climate monitoring.

How does your work benefit European citizens?

The technology being developed in MIDAS will not only impact future Space applications but will also play a role in Security Imaging and high-speed communications.

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LIST OF PARTNERS

- Science and Technology Facilities Council, United Kingdom
- Observatoire de Paris, France
- RPG Radiometer Physics GMBH, Germany
- Universidad Politecnica de Madrid, Spain

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PROJECT INFORMATION

Millimetre-wave Integrated Diode and Amplifier Sources (MIDAS)
Contract no: 242334
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DEVELOPING CRITICAL TECHNOLOGIES