

Master and Engineer Internship: 2018-2019

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Research group : ANODE

Title : Millimeter and Terahertz Monolithic integrated circuits

Abstract :

Next generation of mobile network, 5G, and increasing bit rates require the development of millimeter and THz wireless communications. Recently, IEMN demonstrated the potentiality of its technologies for high bit rate wireless communication at 300GHz. Other demand concerns the development of passive millimeter wave camera for control access area (stadium, concert, check-in airport...). To keep potential weapons out public spaces, a rapid control system is needed. The main example is check-in passengers in airport. The associated effects of this additional security, including delays, long control times are tolerated by customers but causes huge inconvenience and cost. For high communication and security sensors, high frequency circuits are needed. IEMN develops advanced devices in its micro-nano-fabrication platform (1500m² cleanroom) and has all the equipment for the electrical characterization of advanced devices and circuits. ANODE group is currently developing transistor with maximum frequency of 500GHz and recently 1,1THz. We proposed to explore the potentiality of these technologies for low noise and high sensitivity receptors. For confirming high frequency capabilities of our devices, monolithic integrated circuits (MIC) will be designed and fabricated up to 300GHz. The microwave characterizations will be also performed during the internship.

The master or Engineering student will first start to work on the design of the monolithic microwave circuits, mainly a low noise amplifier, using commercial software (ADS). The circuit will be design using current high frequency transistors fabricated at IEMN. The MIC will be fabricated in the IEMN's cleanroom. Student will monitor the progress of the fabrication and will be mainly in charge of the electrical and high frequency characterizations of the MIC.