

## METAL-INSULATOR-METAL TUNNEL DIODES ON MICRO/NANO ANTENNAS FOR ENERGY HARVESTING AND DETECTOR APPLICATIONS

*Liangrid Lutiani Silva (Instituto Tecnológico de Aeronáutica)*

*Newton Adriano dos Santos Gomes (Instituto Tecnológico de Aeronáutica)*

*Vilson Rosa Almeida (Instituto Tecnológico de Aeronáutica)*

**Abstract:** There are open issues related to efficient rectifying device (diode) for effective applications on energy harvesting and detectors based on micro/nanoantennas. Diodes based on Metal-Insulator-Metal (MIM) structure is one of the best candidates for this task, mainly due to its relative simple architecture, as well as its capability to achieve high frequency operations (i.e. Terahertz and optical frequency regimes). The tunneling current mechanism is the main effect that allows fast diode performances. However, there are challenges related to the fabrication process, due to very low thickness of its insulator barrier, usually below 3 nm. Motivated by this, in this theoretical study we design MIM diodes based on very promising insulator for THz and optical frequency operations based on Zinc Oxide (ZnO), combining with Aluminum (Al), Zinc (Zn) and Copper (Cu) metals; we analyze some basic performance features, assuming variations of the insulator thickness.