

## PROJECT / Millimeter Wave Antennas for Next-Generation Satellite Mass Services

# mm-SatCom

### Main Objective:

1) Research of new compact Ka-band satellite antenna solutions capable of operating simultaneously in both uplink and downlink bands. The antennas will be based on the aperture overlap concept. In one approach an adequate frequency-selective multi-layer slab is placed above an array of feeds in order to produce multiple overlapping apertures, each one ensuring adequate reflector illumination. In another approach of the project, integrated shaped lens antennas with multiple feeds attached to its base will be explored with the same objectives.

2) Design of compact low-cost Ka-band antennas for terrestrial terminals, either fixed or installed on moving platforms like cars, trains or ships. These antennas must have a single steerable beam constantly pointing towards the satellite as the terminal moves. This will evolve from a previous concept proposed by the project team, where a steerable shaped dielectric lens pivots in front of a stationary feed requiring no rotary joints which are expensive and prone to faults. New lens configurations will be researched, including flat lens made of inhomogeneous metamaterial.

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Team: [Jorge Manuel Lopes Leal Rodrigues da Costa](#), [Carlos Antonio Cardoso Fernandes](#), [Eduardo Jorge da Costa Brás Lima](#), [Sérgio de Almeida Matos](#), [Ana Catarina Caniço Cruz](#), [Joana Rita Alves dos Santos Silva](#), [Andela Zaric](#), [João Manuel de Almeida Monteiro Felício](#)

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Groups: [Antennas and Propagation – Lx](#)

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Local Coordinator: [Jorge Manuel Lopes Leal Rodrigues da Costa](#)