

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Interactive Presentations (IP)

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DESIGN AND IMPLEMENTATION OF A POSITIONING SYSTEM FOR PARABOLIC ANTENNAS
THAT TRACK LOW ORBIT SATELLITES FROM EARTH STATIONS BASED ON A HEXAPOD
STEWART PLATFORM TYPE**Abstract**

CIATEQ, within the framework of Conacyt-AEM sectoral fund, will carry out the design and implementation of a positioning system for parabolic antennas that track low orbit satellites from earth stations based on a hexapod Stewart platform type. To carry out the project, CIATEQ will hands of experience achieved in the "positioning Robot of the Secondary Mirror (Platform Stewart type hexapod)" project, developed for the Large Millimeter Telescope (LMT) in which it was designed, manufactured and assembled the mechanical system as control algorithms was develop and implemented, however it should be noted that there is a notable difference between both platforms, while for the hexapod of LMT movements in the range of millimeters for linear displacement and millidegrees for angular motion were required to position adequately the secondary mirror to the parabolic focus, an aspect that involves a smaller mechanical system, contrasting with the positioning hexapod to be carried out for the Spatial Mexican Agency which demands infinite movement in Azimuth axis and elevation axis of 0-90 with a precision of millidegrees. This platform should make a very accurate tracking of the trajectory that describes the satellite in the sky; this implies not only have the ability to describe the orbit almost undeviating, but also do so at the speed that the satellite travels in its orbit, so that the satellite link is not lost and therefore the quality of the information that the satellite sends to the ground station. To achieve this, it will require not only the integration of mechanical and electronic systems, with the ability to perform these tasks with the required precision, but also to develop the algorithms that control the actuators as a whole to position the antenna in order to track the satellite trajectory in the way that is intended. This first phase covered by this project, considers the development of conceptual and basic engineering; so that the detailed engineering and manufacturing of a functional prototype will be covered in subsequent phases of the project.