

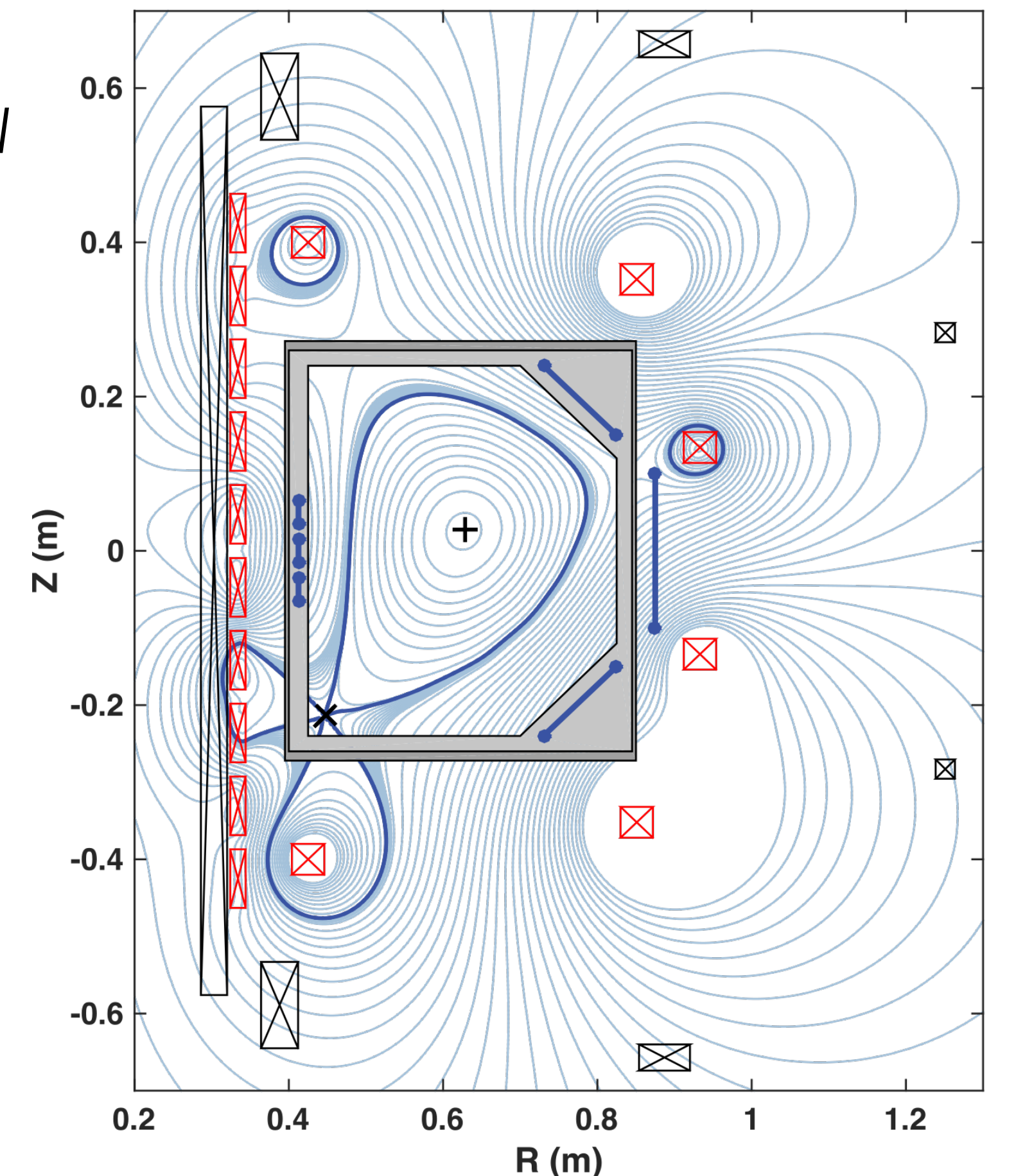
An overview of the upgrade of the TCABR tokamak

- **Brazil is moving towards the establishment of a national laboratory to coordinate and concentrate studies in nuclear fusion across the country**
 - A compact (spherical), high toroidal field tokamak is envisaged
- **An upgrade of the TCABR tokamak is being conducted**
 - The main purpose of this upgrade is the development of human resources with the "know how" required to operate the future Nuclear Fusion Laboratory in Brazil



A versatile plasma control system is being designed for TCABR to allow for a wide range of plasma configurations

- **The upgrade of the TCABR tokamak consists in four main topics**
 - *Installation of additional shaping coils*
 - *Installation of graphite tiles to cover the vacuum vessel inner wall*
 - *Development of a coaxial helicity injection system*
 - *Installation of an innovative set of RMP coils*



TCABR snowflake configuration

Internal RMP coils in both HFS and LFS will allow for a detailed physics model validation of the plasma response in a wide range of coil geometries and spectra

- **5 sets of 18 fast power supplies are being designed to provide rotating RMP fields**
 - Rotation will be controlled in real time to match the perpendicular electron rotation

