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Preliminary study on a Multi Megawatt Cyclotron Complex to Search for CP Violation in the Neutrino Sector ALESSANDRA CALANNA, LUCIANO CALABRETTA, JANET CONRAD, MARIO MAGGIORE, LEANDRO PIAZZA, DANILO RIFUGGIATO, DAEDALUS COLLABORATION — The DAEDALUS experiment offers a novel approach to measuring CP violation in the neutrino sector. The design uses a Multi Megawatt Cyclotron (MMC) complex to produce intense beams of neutrinos from the decay-at-rest of pions and muons. Short-baseline muon- to electron-antineutrino oscillations is observed via inverse beta decay in an ultra-large water Cerenkov detector at DUSEL. The MMC complex needs to be able to accelerate H2+ up to 800 MeV/amu. It consists of an injector cyclotron able to deliver a H2+ beam up to 50 MeV/amu and of a cyclotron booster ring made of 8 magnetic sectors and 8 RF cavities. The layout of the magnetic sectors was designed using the 3-D code OPERA3D. Magnetic fields and forces on superconducting coils were evaluated and optimized with the TOSCA module. Preliminary studies on beam dynamics, losses due to interaction with residual gases, considerations on injection and extraction are also presented.

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