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Tue-Af-Po2.18-09 [40]: The training test research of high stress superconducting magnet for 200 MeV superconducting cyclotron

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Based on the collaboration of Institute of Plasma Physics Chinese Academy of Sciences (ASIPP) and Russia Joint Institute for Nuclear Research (JINR) for proton therapy, a 200 MeV compact superconducting proton cyclotron project (SC200 project) has been launched at ASIPP since 2016. The superconducting magnet is the most critical and challenging subsystem for the cyclotron to provide ~ 3 T magnetic field of central region and enough flutter field to focus the proton beam. The inner radius of the superconducting coil is about 0.7 m and total stored magnetic field is ~ 3.4 MJ. The superconducting magnet has been manufactured and tested in ASIPP. This paper pays attention to the coil 'training' effect which associated with the use of epoxy resin impregnates. The magnet was performed the quench training of twelve times and the current raise to 168.7 A. The axial and hoops mechanical stress on the coil has been analysis. The test process will be outlined in detail, the 'training' results will be discussed in the paper.

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