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Conceptual Design of a C-shaped 6.4 T Superconducting Dipole Magnet

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Sirius is a 4th generation light source with a sub-nm.rad horizontal emittance currently under commissioning in Brazil. The Sirius beamlines will mainly use insertion devices as the source of synchrotron light, and some of the beamlines will use the currently installed central dipole magnets (permanent magnets) of 3.2 T. However, there is a demand for a high-energy x-ray tomography beamline that requires photons with a critical energy higher than 40 keV, which is not achieved with the current dipoles. In this sense, a dipole magnet with a magnetic field higher than 6 T would be of great interest. A conceptual design for a superconducting dipole magnet of 6.4 T, based on conduction cooled NbTi coils and Holmium poles, has been proposed and will be presented, emphasizing the first ideas of the electromagnetic, mechanical, cryogenic and quench protection designs.

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