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## Design Status of a Fast Cycled Low Loss 6 T Model Dipole Cooling at 1.9 K

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The concept of new fast cycled low loss 6 T model dipole cooling at 1.9 K is proposed. The magnet is considered in the context of the FCC-hh high energy injector based on the modernized CERN SPS synchrotron. The new machine would operate in a cycled mode also to feed experimental areas, much like the SPS nowadays. Due to this specific cycled operation, innovative design and development approaches is required to cope with the AC losses in the superconducting cables and iron yoke. The research joins experience accumulated at CERN and JINR respectively in the design and operation of large systems operated at 1.9 K and, in fast ramped and cycled magnets. The specified parameters are the following: magnet aperture -80 mm; aperture field -6 T; field ramp 0.2-0.5 T/s; coil conductor -NbTi; magnetic field homogeneity between 0.12 and 6 T of the order of 5·10e-4. The minimization of the cycling losses is particular important. Total thermal losses should be limited to tentatively < 2 W/m at 4.2 K. The magnet design, and the results of preliminary tests on a candidate NbTi-wire for building a model magnet are presented, expected level of the power losses are discussed.

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