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## **Preliminary lattice design for the rapid cycling synchrotron in the SPPC**

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Rapid cycling synchrotron (p-RCS) is the first synchrotron of the accelerator chain in the proposed Super Proton-Proton collider (SPPC) project. It will provide high-energy and high-power beams for the injection to the downstream accelerators for SPPC collision with the required beam characteristics such as bunch spacing, bunch population and emittance, but also serve independent application program with less restricted beam characteristics and a higher beam power of 3.4 MW. With a designed energy range of 1.2-10 GeV and a repetition rate of 25 Hz, the lattice design plays a mandatory role in beam dynamics. In this paper, three types of linear lattice for the p-RCS, which are based on the basic FODO module, triplet module and negative momentum compaction (NMC) factor module, respectively, are compared. Taking into consideration the longitudinal beam dynamics which requires as a large absolute of slippage factor as possible at the extraction energy, the NMC lattice is considered a preferable solution.

### **Funding Agency**

### **Footnotes**

### **I have read and accept the Privacy Policy Statement**

Yes

**Primary author:** ZHANG, Linhao (Chinese Academy of Sciences)

**Co-author:** TANG, Jingyu (Institute of High Energy Physics)

**Presenter:** TANG, Jingyu (Institute of High Energy Physics)

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