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## **A two harmonics circuit for the powering of the very fast RCS (Rapid Cycling Synchrotron) of the muon collider accelerator**

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Acceleration for a muon collider will have to be extremely fast to ensure efficient transmission of the decaying beams, with acceleration times of the order of 1ms. One of the proposals for such a machine is centered around a rapid cycling synchrotron (RCS), a hybrid lattice of cells with alternating superconducting and resistive dipole magnets. Resistive magnets will swing from negative to positive field level, providing the magnetic flux variations (more than 3600 T/s) that are required for the quick acceleration of the muons, while the superconducting magnets will give a field offset. The resistive magnets will have to be supplied with extremely high peak power levels, in the order of few tens of GW, to provide the necessary magnetic field variations. For the extremely quick magnetic field ramp, this application is unique in the field of the RCS and related technologies. This paper analyses the application of a two harmonics circuit with additional active filter to the powering of the four RCS stages of the muon acceleration to the ultimate 10 TeV energy level

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### **Footnotes**

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

Yes

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