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M1Po3C-05: Magnetic field and force calculation of the new SCU prototypes

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New 0.5m long SCU prototypes were designed based on lessons learned from the previous full length (1.5 m) core experiences. The original monolithic cores have all steel poles. The new cores have plastic back poles to avoid electrical shorts of superconducting wires to cores. Magnetostatic calculation was made for one period model for each of two designs under consideration. Then, magnetostatic, and mechanical analysis was also conducted for the prototype SCUs with the lengths of 29.5 and 23.5 periods. The software used for this simulation is ANSYS Maxwell and Mechanical. Both the magnetostatic and the mechanical analyses confirm the validity of the new design.

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