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## Experimental Study on Effectiveness of Different Reinforcement Layouts Applied to Recent Bi-2212 Test Coils

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Recent development of Bi-2212 insert coil technology at National High Magnetic Field Laboratory (NHMFL) has shown promising in-field performance,  $\sim 440$  A/mm<sup>2</sup> at 16.3 T peak field in 2019, thanks to the matured conductor technology and reliable heat treatment process. Now Bi-2212 coil technology is entering to a new stage to be considered as a competitive candidate for high field (above 20 T) inserts against other suitable superconductors such as Nb<sub>3</sub>Sn or ReBCO. Unlike the other HTS conductors, the commercial Bi-2212 conductor still has no reinforcement at the conductor level and the developers must design their own reinforcement method for the 2212 coils to manage high magnetic stress during their operation. To achieve this task, we have developed a suitable material and reinforcement method for Bi-2212 high field insert. However, those reinforced Bi-2212 coils become a complex composite of 2212, braided insulation, epoxy, and reinforcement materials and it is complicated to confirm the effectiveness of the proposed reinforcement method quantitatively. To find out the effectiveness of our reinforcement design precisely, a set of similar coils (in terms of size, number of turns, and conductor length) with different reinforcement layout will be made and tested in 14 T LTS test bed located at Applied Superconductivity Center (ASC) of NHMFL. The test results will be analyzed with FEM stress analysis.

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