

Electromagnetic field analyses of coils and assembled conductors consisting of coated conductors

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Abstract: We have been developing a series of numerical models to reveal electromagnetic phenomena in superconductors, i.e., the temporal changes in current / magnetic flux distributions, which substantially influence the performances of coils and assembled conductors such as ac losses and field quality (uniformity and stability) of magnets. The latter is important in some magnets for medical uses such as ones for MRI and accelerators for carbon cancer therapy. In the models, three-dimensional structures of superconductors in coils and assembled conductors as well as superconducting properties must be taken into consideration. In this presentation, recent results in our groups will be summarized. The topics in the talk will include the influence of striation of coated conductors in pancake coils, some considerations on various approximations in modellings, and examples of analyses of three-dimensional coils.