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Parametric analysis of AC losses in HTS power cables

Content :

After the discovery of High Tc superconductivity, several projects in electrical engineering have started to realize power devices such as superconducting power cable. This device uses HTS materials in the form of long tapes, which are prepared by powder in tube method (1G tapes) and coated conductor method (2G tapes). AC losses are important in realizing HTS AC power cables and are dependent on various physical properties of HTS tapes (current, frequency, applied magnetic flux density, width and thickness of HTS tapes, gap between tapes). The main objective of this work is to determine gap between the tapes and radius of former so that AC losses will be minimized (mainly Hysteresis and eddy current loss). Further, the variations of AC losses w.r.t. width of the tape ($2w$), critical current (I_c), frequency (f), normalized current (I_0/I_c), thickness of tape (t_c) are analyzed for different commercially available HTS tapes.

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