

Pitch Calculation of 4-layer HTS Power Transmission Cable for Balanced Sharing Current

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Abstract – A typical HTS power transmission cable has multi-layer conductor structure to increase the current capacity. The tapes of the innermost layer are wound on a round former, and adjacent tapes of another layer are separated by a thin insulating film. However, usually the current is not evenly distributed among the layers because of inductance difference of each layer, and inductance is provided by a wound pitch of each layer's tape. Consequently a method to make the current distribution more uniform is a adjusting the tape winding pitch, hence reduce the AC loss. Thus, this paper describes a current distribution by adjusting a tape winding pitch of each layer. Also, this paper shows recommendation for future cable conductor prototypes.