# 26th National Symposium on Cryogenics and Superconductivity

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## Minimization of AC loss in High Temperature Superconducting power cable with variable winding Pitches

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Content :

High temperature Superconducting cables (HTS) are expected to provide a better alternative to the conventional electric power transmission cables in view of their large current carrying capacity, low transmission losses, compact structure and environment friendly operation. Several projects on HTS cables have been initiated around the world to introduce this technology into the real grid operation. The major losses in HTS cable include AC loss, heat intrusion from the surroundings and conduction heat transfer from current leads. Different kinds of AC loss includes Hysteresis loss, coupling loss and eddy current loss in composite conductors. This paper concentrates on minimization of AC loss in multi-layer HTS cable. AC loss in multi-layer HTS cable is due to presence of varying magnetic field or current. In case of multi-layer HTS cable the inner layers have higher impedance than outer layer, due to which current concentrates more in outer layer. This contributes AC losses in HTS cables. Therefore, by adjusting winding pitch of each layer of HTS cable, the AC loss can be minimized.

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