

## AC Loss Analysis of Multi-Stacked Superconducting Tapes with Unbalanced Current Distribution

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A high temperature superconducting power transformer gets its advantages over the conventional ones when the rated capacity of the HTS transformer becomes 30MVA or more. The standard capacity of the recent 154kV/22.9kV power transformer is 3 phases' 60MVA in Korea, which means that the rated current of the secondary becomes, more than 1,500A. Considering the current capacities of the HTS wires are being developed recently, it is inevitable to use the HTS wires in parallel in order to be applied to the power transformer. But non-uniform distribution of currents and AC loss are major problems in parallel-stacked HTS tape.

In this work, we have prepared a multi-stacked tapes composed of BSCCO tapes and measured current distribution in HTS multi-stacked tapes. The current distribution was indirectly found from the results of the self-field distribution measured by an array of hall sensors located around the multi-staked tape. In order to confirm the validity of this system, measurement of current distributions in a test conductor composed of insulated copper wires was carried out. We measured the current distributions in multi-stacked tapes at 77K. Further; we investigated the influence of AC loss on current distribution in the multi-stacked superconducting tape. AC loss depends on the current distribution in HTS multi-stacked tape was discussed.

Keywords : AC loss, HTS transformer, Multi-stacked, tape, current

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