

Current Distribution Characteristics of HTS Tapes After Applying Over-current

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Voltage-current characteristics of High Temperature Superconductor(HTS) tapes after applying the current that is beyond their critical current was investigated. HTS tapes made by PIT(Powder In Tube) method are composed of superconductor and metal sheath. When the current was applied over the critical current, the current started to flow through the metal sheath instead of superconductor changed to normal conductor. This current distribution plays an important role in studying the properties such as quench protection of HTS power apparatus and AC loss. When mechanical stress was given to HTS tapes, critical current was degraded. Using HTS tapes that have critical current, 68A, we examined the effects of mechanical stress on HTS tapes. In addition, the electrical behavior of HTS tapes with applied external field were studied. As a result, it was found that the resistance of superconductors and joule heat due to the over-current resulted in current distribution in HTS tapes. Critical current of HTS tapes was considered as a main factor deciding over-current characteristics.

Keywords : HTS tapes, superconductor and metal sheath, over-current, current distribution