

The State of Multi-filament HTS Tapes under Increasing Tension in a Static Current

Jin-Hong Joo^{a,b}, Seog-Whan Kim^a, Kyu Jeong Song^a, Chan Park^a, Hae Joon Kim^a,
Young-Kil Kwon, Jung-Pyo Hong^b

^a *Korea Electro-Technology Research Institute(KERI), Changwon, Korea,*

^b *Dept. of Electrical Engineering, Changwon National Univ., Chanwon, Korea*

High temperature superconductor (HTS) tapes are now commercially available for practical application. HTS tapes from different manufacturers using similar but not-exactly-the-same fabrication processing show different electrical and mechanical characteristics. From the viewpoint of an application, it is very important to investigate the properties of HTS tapes under mechanical stress, because various kinds of strain including tensile, bending, and twisting strains are generated while the tapes are wound in the magnets or the cables. The mechanical stress degrades the critical current of an HTS tape. A small stress causes a small degradation, but if the stress is higher than a certain value, the so called threshold stress, the stress damages the filaments in the HTS unrecoverable. To investigate this phenomenon, we applied a constant current to HTS tapes and increase the tension continuously from 0 to the complete breakdown. While increasing the tension, the voltage of the HTS sample is measured. The results of the measurements and the analysis will be presented.