

## WB5-2

### Local-vs.-Global Current-Voltage Characteristics in HTS Tapes

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It is well established that a current-voltage (I-V) characteristics in HTS tape is generally rounded typically characterized by a power law model due to sever influence of thermal fluctuation and/or random pin distribution. It is crucial, therefore, to take into account such rounded I-V characteristics as a function of external magnetic field and temperature for a design of HTS based device. Generally, such I-V characteristics are measured by the four-probe method using a short piece sample or micro-bridge, then used as a design parameter of a coil or magnet, whereas an actual tape length in a device is in the scale of hundreds of meters or longer. However, the influence of a spatial variation on its I-V characteristics in a long length tape is not yet clear. In this study, we have investigated the relationship between a local I-V characteristics and a global one based on a measurement of reel-to-reel local  $I_c$  measurements and measurements on position dependent I-V characteristics of HTS tapes in both Bi-2223 and RE-123. Relationship among the power law I-V characteristics in local measurements, spatial variation of  $I_c$  and  $n$ -index, and the influence of flux pinning and thermal fluctuation will be clarified.

This work was supported by JSPS KAKENHI Grant Number 19H05617 and the New Energy and Industrial Technology Development Organization (NEDO).