



Contribution ID: 901

Type: Poster

Thu-Mo-Po.09-12: A device for thickness profile measurement of REBCO tapes

Thursday 3 July 2025 08:45 (2 hours)

The accurate measurement of thickness profile across the width of REBCO conductors is critical to design and fabrication of REBCO magnet windings. This is because the non-uniform thickness profile such as so-called 'dog-bone' or 'pillow' shapes compromise winding's geometrical integrity, which is especially critical for dry-wound pancake coils. Non-uniform also has significant impact on the Cu/non-Cu ratio which is critical for quench performance.

Conventionally thickness is measured by a micrometer at several locations cross the width. This convenient method, however, does not have sufficient resolution for thickness profiling. For more accurate profile determination, a polished cross-section sample needs to be prepared and subsequently measured by microscopy. This method is accurate but labor intensive and time consuming. A laser micrometer works well for inspection of diameter of round wires, but it is not applicable in thickness measurements of flat tapes.

We have developed a thickness gauge based on digital indicator with ball contacts of small diameter. With accurate transverse positioning, it is capable of measuring thickness profile with a resolution of 50 μm (80 points along 4 mm width). The device is calibrated by a thickness standard. The profiles of a dozen samples were measured and compared well with the results by cross-sectional microscopy. The calibration and cross-checking confirm that this device is suitable for quality assurance tests for large REBCO magnet projects.

Author: Mr GAVIN, Noah (National High Magnetic Field Laboratory, USA)

Co-author: LU, Jun (National High Magnetic Field Laboratory, USA)

Presenter: Mr GAVIN, Noah (National High Magnetic Field Laboratory, USA)

Session Classification: Thu-Mo-Po.09 - Conductor and Coil Measurement/Test Techniques and Facilities II