



Contribution ID: 273

Type: **Oral presentation (15min)**

## **A round Rutherford cable concept with HTS Roebel Coated Conductors strands**

*Thursday 10 July 2014 14:45 (15 minutes)*

The high temperature REBCO development is progressing in conductor length, performance and variety of architectures. Such conductors are available commercially and can be used in applications. One of the coated conductor's applications are superconducting magnets, which require high current carrying capabilities. Those high currents can be accessed by high current cables.

Recently we presented a flat Coated Conductor Rutherford cable with Roebel strands. Such design advantages are high current capability and low AC losses. Unfortunately this design, with relatively short twist pitch, introduces a small degradation of the Roebel strand critical current. Due to those difficulties and limitations, this design was revised and a new form of round Rutherford cable with Roebel strands proposed.

A demonstrator of CC-Rutherford cable was built with commercially available Roebel cable from Industrial Research Ltd. In this concept 10 strands of Coated Conductor Roebel cable as single strands were used. Roebel strands were wound on central round Rutherford former with 0.66 m twist pitch. The current redistribution was controlled on each measurement step, as well on fully assembled cable. The 2.5 kA critical current of the 1.4 m long Rutherford cable at 77 K was measured and met the expectation.

**Author:** KARIO, Anna (Karlsruhe Institute of Technology)

**Co-authors:** Dr JUNG, Alexandra (Institute for Technical Physics, Karlsruhe Institute of Technology); KLING, Andrea (Institute for Technical Physics, Karlsruhe Institute of Technology); RUNTSCH, Brigitte (Institute for Technical Physics, Karlsruhe Institute of Technology); Dr GOLDACKER, Wilfried (Institute for Technical Physics, Karlsruhe Institute of Technology)

**Presenter:** KARIO, Anna (Karlsruhe Institute of Technology)

**Session Classification:** Thu-Af-Orals Session 13

**Track Classification:** C-08: Fusion magnets and conductors