



This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.

# WP 8.6 Multi-Layer HTS on Conduit Cable

Kick-off Meeting 4.5.21

T. Winkler / GSI

iFAST

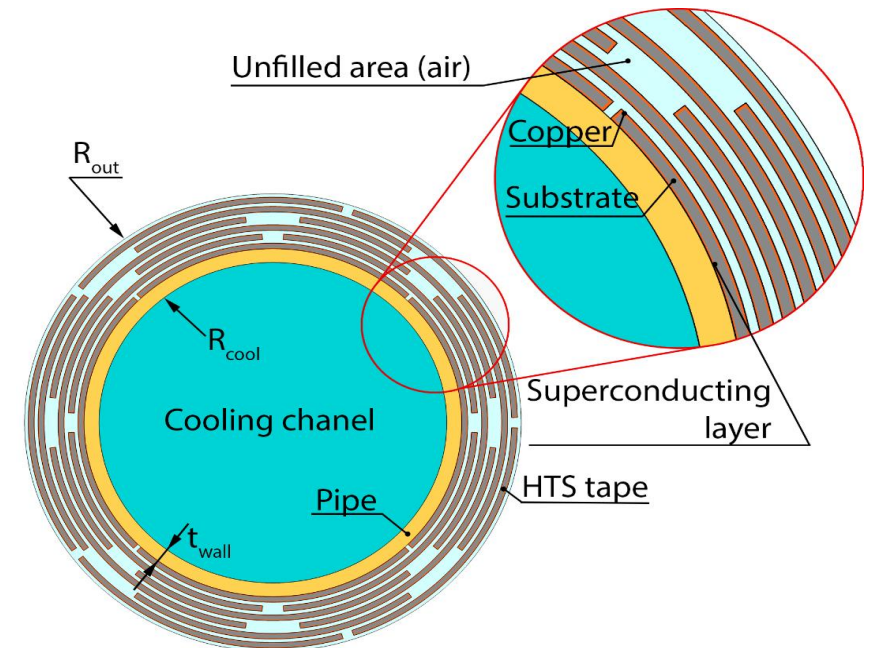


# Partners

- Institut für Luft- und Kältetechnik, Germany
  - Andreas Kade
- University of Twente, The Netherlands
  - Herman ten Kate, Marc Dhallé
- Institute of Electrical Engineering, Slovakia
  - Fedor Gömöry, Tomas Kujovic, Mykola Soloviov
- Gesellschaft für Schwerionenforschung, Germany
  - Tiemo Winkler, Kei Sugita, Christian Roux, Peter Spiller

# Project Aim

- Development of a Multi-Layer HTS on Conduit Cable
  - using 2nd gen HTS tapes
  - round multiple layer cable
  - central cooling channel for forced flow cooling
  - final goal: 30 kA at 4.5 K
  - outer dimensions: ~10 mm
- Application:
  - 2nd stage of the Heavy Ion Synchrotron at FAIR
  - possibly in sc transmission line of sc SMES (see Task 3) (under investigation)



# Milestone and Deliverable

- Milestone:
  - Due: 30.04.23
  - What: Laboratory prototype cable
- Deliverable:
  - Due: 31.12.23
  - What: Report on design parameters

# Contributions / Time line

- GSI: Magnet design parameters
- All: Tape selection based on magnet design parameters and sample tape performance
- ILK: Tape procurement
- IEE: Cable manufacturing
- IEE: Cable testing at 77 K
- UT: Cable characterization at 4.2 K
- UT: Cable modelling to predict and understand the AC loss characteristics
- ILK and GSI: forced flow testing of the cable to evaluate the thermal performance.

# Next steps

- GSI: Iteration through different magnet designs (coil layers, amount of turns, center field quality, max heat load, yoke)
- IEE: Compilation of suitable tape list based on rough cable physical properties
- All: Extensive discussions on parameter list and field of play for cable design

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