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

iFAST WP9 kick-off meeting 05/05/2021

Partners Introduction

Graeme Burt (Lancaster University)

iFAST

Cockcroft Institute

- The Cockcroft Institute is a collaboration between Lancaster, Manchester, Liverpool and Strathclyde Universities and the Accelerator Science and Technology Centre at STFC Daresbury. It includes both physicists and Engineers. All staff are based in a joint facility on the site of Daresbury Laboratory.
- Lancaster University Engineering department specialises in RF systems including LLRF, HPRF amplifiers, NCRF and SRF cavity design and testing, and Cryomodule design.
- Works closely with STFC on SRF projects at Daresbury labs

m… …os… PhD

w… …emi… and 2 PhD

Taaj Sian

Dan Turner

Dan Seal

SRF Activities

- LHC crab cavities and cryomodules
- ILC crab cavity development

- SRF field penetration studies
- Flat sample SRF measurements with a choke cavity
- 6 GHz split SRF cavities testing

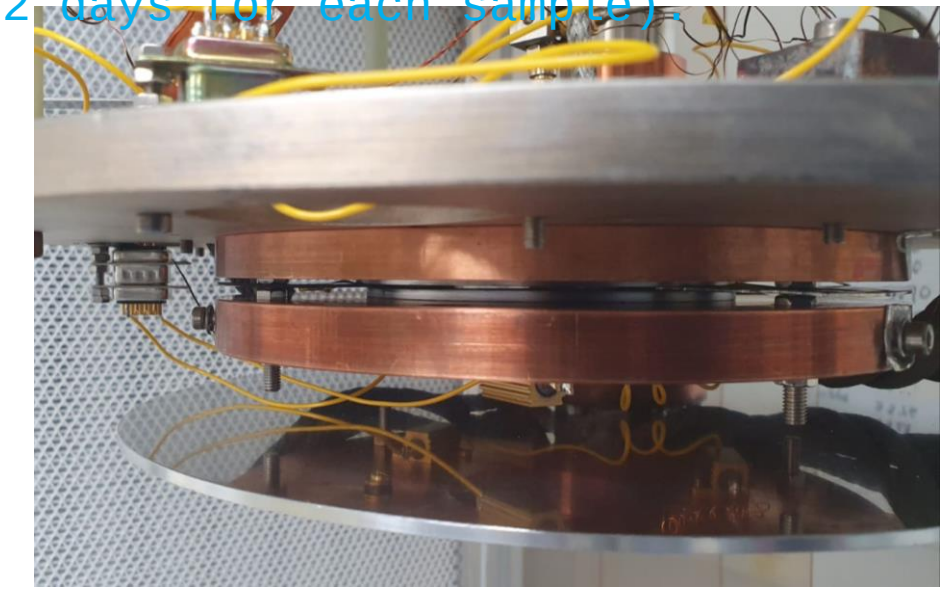
- Development of the Cockcroft Institute RF radiation test bunker at Daresbury Laboratory for vertical testing

IFAST Activities

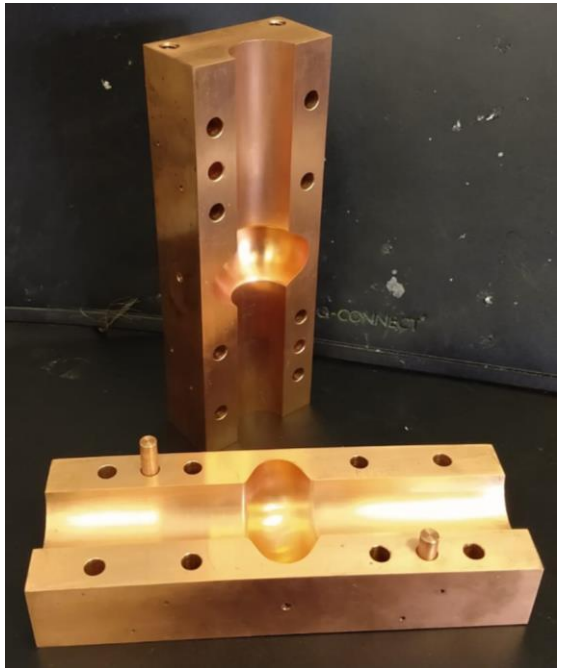
- Involved in tasks 1-3
- **Task 9.1**: Coordination and strategy for innovative superconducting accelerating cavities
  - Liaising with the HEP roadmap (Advanced RF) panel
- **Task 9.2**: Innovative SC accelerating cavity prototype
  - 6 GHz split cavity testing and supporting UKRI on 1.3 GHz cavity testing
- **Task 9.3** : Optimisation of process parameters and target development for SRF cavity coating with A15 material
  - Flat sample testing on RF choke and field penetration test rigs

Sample testing

Lancaster have designed and operate an SRF choked cavity with STFC dedicated to the measurement of superconducting coatings at 7.8 GHz has been updated to operation with a closed-cycle refrigerator. The RF Choke allows high Q storage without contact between the cavity and the smple. Low power measurements with an emphasis on fast turn-around time (~2 days for each sample).



Cavity testing



Lancaster University Split cavity:
- Easy to coat with either conventional planar magnetron or in tubular geometry used for RF cavities
- Easy to inspect

4 cavities manufactured

3 split longitudinally so surface current run along the gap, and hence there is no RF contact resistance.

Also have one cavity with a transverse cut which we plan to bond together.

iFAST

Thank you for your attention

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