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M2Or4A-01 [Invited]: Bulk Superconductors for Motors – Practical Materials Challenges

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For those versed in superconductivity, flux pinning and critical current are the keys to improving performance in practical applications. When considering the practical deployment of bulk superconductors in rotating machines, however, the range of practical challenges to deployment is considerably enlarged. In this contribution we describe progress made in an ongoing collaboration between Siemens AG and the University of Cambridge targeted at addressing some of these challenges. We will discuss three key areas, practical approaches to magnetisation, quantification of losses due to the AC magnetic fields present in a real machine environment and mechanical strength characterisation and reinforcement. In each area I will set out the progress that has been made in Cambridge and elsewhere in addition setting out a roadmap for future advances.

Primary author: Dr DURRELL, John (University of Cambridge)

Co-authors: Mr SRPČIĆ, Jan (University of Cambridge); Mr HUANG, Kaiyuan (University of Cambridge); Dr AINSLIE, Mark (University of Cambridge); Dr ZHOU, Difan (Shanghai University); Dr SHI, Yun-Hua (University of Cambridge); Mr DENNIS, Tony (University of Cambridge); BOLL, Martin; Dr FILIPENKO, Mykhaylo (Siemens AG)

Presenter: Dr DURRELL, John (University of Cambridge)

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