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FastGrid

COST EFFECTIVE FCL USING ADVANCED SUPERCONDUCTING TAPES FOR FUTURE HVDC GRIDS

Newsletter #1
December 2017

Welcome to the first newsletter of FASTGRID project

Dear readers,

Already eleven months went on since the start of the FASTGRID project. During this period the works between the 12 partners have already produced results and some have already been presented during the EUCAS conference in Geneva in September. Our first end-user board will be held soon. In the coming months new results will be presented with more details in the next FASTGRID newsletters. This first newsletter will highlight the works carried out by the company THEVA about the REBCO tape at the heart of FASTGRID project.

We wish you an interesting reading; please visit our website to find out more.

Pascal Tixador, FASTGRID coordinator.

FASTGRID is a European project (H2020); the project aims to modify and to significantly enhance the technical and economic attractiveness of high-temperature superconductor (HTS) coated conductors (REBCO conductors) for their application in Superconducting Fault Current Limiters (SCFCL).

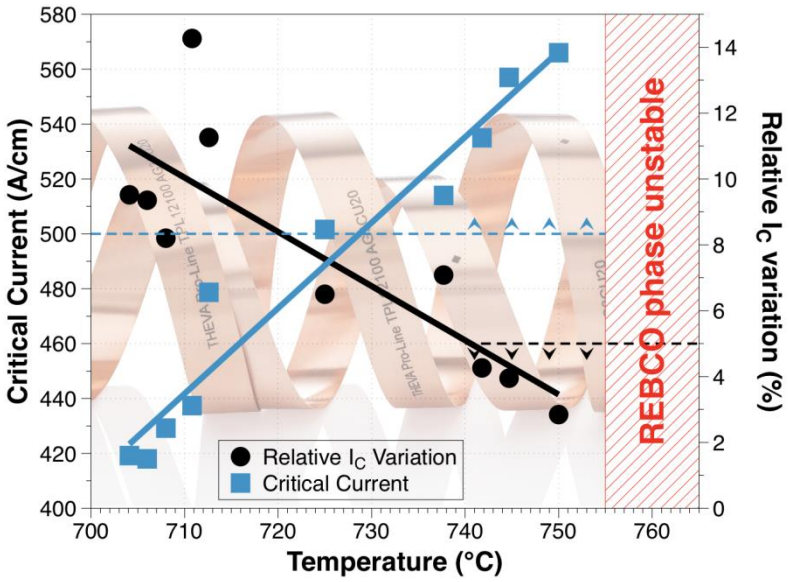
Members of the Consortium at the second meeting of the project at Karlsruhe Institute of Technology (KIT), May 2017.

FOCUS ON

Cost-effective REBCO tape for SCFCLs

A major goal in the FASTGRID project is to reduce the overall cost of SCFCLs. This can be achieved be reducing the production cost of the REBCO tape on one hand. But also by minimizing the total need of this tape. For the later high goals were set in the project: the tape must have a high critical current IC of at least 1000A/cm at 65K and IC must be very homogeneous along the tape to allow homogeneous switching at high voltages.

These demands drive fabrication processes to new limits. As can be seen in the figure, by increasing the temperature during the superconductor deposition to the edge of the stability line of the superconducting phase, an improvement in the critical current density and the homogeneity can be achieved.



However, this puts high demands on processes control. Temperature as well as oxygen pressure have to be kept within a narrow band around their optimal values, although measuring and controlling these quantities is a challenge under high vacuum conditions. Process stability, however, is key to high production yield which has great leverage on the cost of the REBCO tape. Therefore, future work will focus on reducing the impact of fluctuations in process parameters and improving control over them.

Read More about FASTGRID objectives

THEVA stands for reliable and highest quality superconductor wire production. Various types of THEVA Pro-Line high temperature superconductor wire can be delivered in lengths up to several hundreds of meters. Applications range from fault current limiters and high current cables to high end research magnets. Additionally, we design and deliver customized HTS coils. Tapestarä, our powerful characterisation tool for HTS tapes, is already used all over the world.

For more information: www.theva.com

NEWS

The consortium welcomes PhD students

Pedro BARUSCO, joined ICMAB-CSIC from the 16.09.2017 and started work on his PhD thesis in the group of Prof Xavier Obradors on Characterization of Coated Conductors on Sapphire substrates for optimizing superconducting and quench properties. A part of his work shall also focus on oxygenation and characterization of CFD samples. He already presented his first results at the third FASTGRID project meeting in Barcelona. We would like to take this opportunity to welcome him in the group and wish him success for future work.

Martina KLIMENTOVA, obtained her M.Sc. degree in Materials Science from Slovak University of Technology in Bratislava. Her diploma thesis was focused on numeric analysis of stress-strain distribution during mechanical loading of superconducting tapes. She started her PhD. study on the 1st September 2017 in the group of Marcela Pekarcikova (STUBA) and will contribute in frame of project FASTGRID to the improvement of CC tapes in term of thermal stabilization.

Arij CHERIF, is an engineer in electrical engineering graduated from the National Higher Engineering School of Tunis (ENSIT) in Tunisia. Arij will actively contribute to all the measurements made in Grenoble and to the improvements of the conductor in terms of electric field together with teams from CNRS and G2Elab. We are very pleased to have Arij contributing to our research and we wish her all the success for her PhD.

Jiabin YANG obtained his M.Sc. degree in Electrical Engineering from the University of Chinese Academy of Sciences, Institute of Electrical Engineering. Jiabin started his PhD in September at EPFL in the group of Dr. Bertrand Dutoit and will contribute to FASTGRID within the scope of the project and his PhD work. We welcome Jiabin Yang to the consortium and wish him success in the completing his work.

EVENTS

Members of the consortium participated in EUCAS 2017

For the 13rd European Conference on Applied Superconductivity (EUCAS), several members of the consortium of FASTGRID project attend the meeting in Geneva and presented their work.

Following, the list of the communications made by the partners:

A new EC project: FASTGRID, P. Tixador, M. Bauer, C.E. Bruzek, A. Calleja, G. Deutscher, B. Dutoit, F. Gomory, L. Martini, M. Noe, X. Obradors, M. Pekarcikova, F. Sirois

Operation of a SCFCL at 65 K, P. Tixador, J. Vialle, A. Badel

Numerical investigations of REBCO conductor with high limitation electric field for HDVC FCL, G. Escamez, J. Vialle, C.E. Bruzek, V. Grosse, M. Bauer, P. Tixador

Double-sided inkjet printed YBCO films on CZO/YSZ buffered sapphire substrates, Roxana Vlad, Boaz Almog, Mishael Azoulay, Marta Vilardell, Albert Calleja, Teresa Puig, Guy Deutscher, Xavier Obradors

First End-Users Board meeting

Our first End-Users Board meeting will be held on **Tuesday 21st November, 2017** in Madrid. This 2-hour meeting will be organised as a side meeting during the 3rd Best Paths General Assembly. It will benefit from the skills and knowledge of participants of this FP7 European project.

The End-User board will serve as the advisory instance for our FastGrid project, providing to our consortium the mandatory guidance on the technical specifications of our FCL. It will be also a unique occasion to share visions of the final users on the next generation grid architecture and protection. Around the same table European grid stakeholders and large European utilities will be gathered. Exciting and open exchanges between all the participants are expected.

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