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An Extrudable Low-Cost NbSn PIT Conductor for Applications to HEP Magnets

Cooperative Research and Development Agreement Final Report

CRADA Number: FRA-2008-0002

Fermilab Technical Contact: Emanuella Barzi

Summary Report
31 December 2019

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In accordance with Requirements set forth in Article XI.A(3) of the CRADA document, this document is the final CRADA report, including a list of Subject Inventions, to be forwarded to the Office of Science and Technical Information as part of the commitment to the public to demonstrate results of federally funded research.

CRADA number: FRA-2008-0002

CRADA Title: An Extrudable Low-Cost NbSn PIT Conductor for Applications to HEP Magnets

Parties to the Agreement: SupraMagnetics, Inc. and Fermi Research Alliance, LLC

Abstract of CRADA work:

An economical, hot, extrudable, powder-in-tube (PIT) Nb3Sn process is needed for use in magnets for future High Energy Physics (HEP) accelerator research. In this project, a new low-cost intermetallic powder will be developed and implemented with an advanced high-performance powder-in-tube (PIT) Nb3Sn design for hot extrusion and drawing. Phase II will involve further optimization of the hot extrusion approach for multifilament Nb3Sn billets. The powder manufacturing approach will be used to fabricate advanced PIT designs on intermediate size billets. A prototype conductor will be scaled-up and assembled. The material produced will be made available for testing, and for building prototype cables and test magnets.

This work was funded in part by DOE SBIR Award DE-FG02-06ER84482.

Summary of Research Results:

The research report for this project (OSTI Identifier 1037458) has not been made publicly available but can be requested from OSTI. The report has been incorporated in its entirety in the two patents listed below.

Related Reports, Publications, and Presentations:

Leszek Richard Motowidlo. *An Extrudable Low-Cost Nb3Sn PIT Conductor for Applications to HEP Magnets*. United States: N. p., 2012. Web.
(OSTI Identifier 1037458)

Subject Inventions listing:

Motowidlo, Leszek; *Method of manufacturing superconductor wire*, U.S. Patent No. 8,832,926, filed August 7, 2009 and issued September 16, 2014.

Motowidlo, Leszek. *Powder and rod process for forming superconducting wire and method of manufacture thereof*, U.S. Patent No. 9,385,295, filed August 7, 2009 and issued July 5, 2016.

Report Date: 31 December 2019

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