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Collaboration on Radiation Driven Chemistry and Accelerator Operations

Cooperative Research and Development Agreement Final Report

CRADA Number: FRA-2018-0017

Fermilab Technical Contact: Charles Cooper

Summary Report
30 September 2019

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In accordance with Requirements set forth in Article XII 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.

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CRADA Title: Collaboration on Radiation Driven Chemistry and Accelerator Operations

Parties to the Agreement: University of Notre Dame Du Lac and Fermi Research Alliance, LLC.

Abstract of CRADA work:

The Notre Dame Radiation Laboratory (NDRL) will contribute subject matter expertise to increase the Fermilab Illinois Accelerator Research (IARC) team's knowledge of radiation chemistry processes. NDRL will do this by offering guidance on what analytical equipment to use to measure the effects of electron beam treatment during and post treatment. NDRL will also offer guidance that will help further develop IARC applications. The application areas are not limited to, but may include chemistries in the energy generation, industrial and environmental sectors.

Fermi National Accelerator Laboratory's IARC team will contribute subject matter expertise on accelerator operations to help NDRL optimize operation of their Titan-Beta accelerator. The objective of NDRL is to optimize accelerator output, as well as the beam transport and focusing from the accelerator to several experimental beam ports. NDRL also wants to install and optimize a new subharmonic pre-buncher to be able to deliver sub-nanosecond timescale doses for the study of reaction kinetics decoupled from molecular diffusion.

Summary of Research Results:

This collaboration increased the knowledge of the IARC team's understanding on chemistry to develop radiation driven applications for the compact accelerator. In addition, the collaboration increased the ability of NDRL to efficiently operate their accelerator to allow them to better study effects of ionizing radiation on chemical systems.

Related Reports, Publications, and Presentations:

None

Subject Inventions listing:

None

Report Date: 30 September 2019

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