Gated Field-Emission Cathode Radio-Frequency (RF) Gun

Cooperative Research and Development Agreement Final Report

CRADA Number: FRA-2013-0006

Fermilab Technical Contact: Charles Thangaraj

Summary Report
29 November 2016
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**CRADA number:** FRA-2013-0006

**CRADA Title:** Gated Field-Emission Cathode Radio-Frequency (RF) Gun

**Parties to the Agreement:** RadiaBeam, LLC and Fermi Research Alliance, LLC

**Abstract of CRADA work:**

The goal of this CRADA was to procure the carbon nanotube cathode from Radiabeam, install it in HBESL and make current measurements as a function of the gun gradient. The gun was operated at 1.3 GHz. After testing, send the cathode back to RadiaBeam for surface analysis.

Prof. Piot (NIU/Fermilab), Dr. Daniel Mihalcea (NIU), Harsha Panuganti (NIU Ph.D student) and Jayakar Thangaraj (Fermilab) led the experimental efforts at HBESL.

**Summary of Research Results:**

All the above mentioned objectives have been reached.

For science results see the following peer-reviewed articles.

**Ampère-Class Pulsed Field Emission from Carbon-Nanotube Cathodes in a Radiofrequency Resonator**

"Simulations of Field-Emission Electron Beams from CNT Cathodes in RF Photoinjectors"
Subject Inventions listing:

None

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