Contribution ID: **46** Type: **Poster Presentation**

SOLID STATE LASER TRIGGERING SYSTEM FOR THE HERMES-III ACCELERATOR

Tuesday 5 June 2018 13:30 (1h 30m)

The Hermes III accelerator is a 20-MV linear induction accelerator that has been in operation at Sandia National Laboratories since the late 1980's. Energy is initially stored in the accelerator in ten Marx banks that are discharged into twenty intermediate store capacitors. These intermediate store capacitors are then switched with SF6-insulated high voltage rim-fire switches into eighty parallel pulse forming lines that further condition the pulse before finally delivering it to the twenty induction cavities arrayed along the axis of the machine. Originally, a single 0.9-J KrF laser operating at 248 nm, the output of which was divided into twenty separate beamlets, was used to trigger the rim-fire switches, however as part of a recent upgrade to the accelerator the gas laser system was replaced with a new solid-state laser triggering system. The new system is comprised of 10 flash-lamp pumped, Q-switched Nd:YAG lasers (Tempest 300), each having an energy output of 35˜40 mJ at a wavelength of 266 nm. Each laser is responsible for triggering two rim-fire switches. Overall reliability for the accelerator's operation with these new lasers is increased, and by varying the times at which the individual lasers fire it becomes possible to tailor the shape of the output pulse. The optical layout and other details of this solid-state laser triggering system is presented, along with initial operational data from the HERMES III accelerator using this system.

Author: GRABOWSKI, Chris (Sandia National Laboratories)

Co-authors: JOSEPH, Nathan (Sandia National Laboratories); COFFEY, SEAN (SANDIA NATIONAL LABORATORY); HUGHES, Benjamin (Sandia National Laboratories); LOTT, John (Sandia National Laboratories); OWENS, Israel (Sandia National Laboratories); TILLEY, Gary (Sandia National Laboratories)

Presenter: GRABOWSKI, Chris (Sandia National Laboratories)

Session Classification: Poster 2 - High Voltage Design and Power Modulator Components