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High Voltage, Fast Kicker Power Supply

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Short-pulse dielectric Two-Beam Accelerators (TBAs) have the advantage of producing high accelerating gradients near GV/m at significantly lower cost and complexity over traditional superconducting accelerators, which could significantly reduce the overall cost of accelerators for both scientific and industrial applications. One challenge is the development of a high voltage fast kicker system for the staged dielectric TBA. Kickers are electromagnetic devices that create very fast fields to deflect charged particles to divert a portion of the beam away from the accelerator for use. In general kicker systems require fast rise times and precision flat-top for uniform beam deflection. The requirements for the fast kicker system for dielectric short-pulse TBA are very demanding, and there is currently no power supply that can meet all the necessary requirements. Eagle Harbor Technologies, Inc. has developed unique high voltage nanosecond pulse technology that can be utilized to meet the requirement for future TBA systems. EHT has demonstrated an 80 kV modular power supply system with fast rise time capability (~16 ns). To reach the desired output voltage of 160 kV EHT proposes to combine two of the 80 kV systems to enable the fast kicker power supply.

Primary author: Dr ZIEMBA, Timothy (Eagle Harbor Technologies, Inc.)

Co-authors: PRAGER, James (Eagle Harbor Technologies, Inc.); Dr MILLER, Kenneth (Eagle Harbor Technologies, Inc.)

Presenter: Dr ZIEMBA, Timothy (Eagle Harbor Technologies, Inc.)

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