

## Academia-Industry Matching Event on Superconductivity for Accelerators for Medical Applications



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### **Developing a modern, high-quality proton therapy medical device using a compact superconducting synchrocyclotron**

*Friday 25 November 2016 08:30 (20 minutes)*

The MEVION S250 is a proton therapy system based on a gantry mounted superconducting synchrocyclotron. The synchrocyclotron is a 250 MeV accelerator weighing less than fifteen tons with magnetic fields in excess of ten Tesla and an extraction radius of only 30 cm. The compact architecture allows delivery of high quality proton therapy without the need for beam lines, magnetic gantries or energy selection systems. The entire system is designed for its intended use as a medical device and is easily operable by a single therapist without the need for additional engineers or physicists. In addition to the superconducting magnet, the accelerator includes an efficient frequency modulated radio frequency system with a slew rate in excess of 50 GHz/sec, maintenance free vacuum and ion source systems and a highly stable extraction which maintains the proton energy to better than 0.1%. The fast pulsed nature of a synchrocyclotron is also well suited for efficient and safe pencil beam scanning delivery. The MEVION S250 Hyperscan system has of scanning speeds of more than 10 m/sec, layer switching times of less than 50 ms and volumetric delivery to a one liter field in six seconds resulting in robust IMPT treatments without the need for patient specific devices.

**Presenter:** ZWART, Townsend (MEVION Medical Systems)

**Session Classification:** Particle therapy