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Construction and Commissioning of the Beamline for the UCN Source at TRIUMF

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The Japanese-Canadian Ultracold Neutron (UCN) Source is a new facility under construction at TRIUMF. The primary physics goal of this facility is a world-leading measurement of the neutron electric dipole moment. In order to achieve this goal, we require the creation of the world's highest UCN density; this is turn requires a high-power spallation target producing neutrons.

Over the last couple years, a new TRIUMF beamline has been constructed that delivers 20kW of 500MeV protons to a high-power water-cooled tungsten target. This work culminated on Nov 22, 2016, when first "protons on target" was achieved. We will describe the details of the UCN beamline construction, including the magnets, vacuum, diagnostics and target systems. A particular focus of the talk will be the design and commissioning of the UCN kicker magnet, which will divert a small fraction of the TRIUMF beamline 1A beam to the UCN target with minimal impact to other users of that beamline.

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