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Directional measurements of fast neutron backgrounds at SuperKEKB

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During the commissioning of the SuperKEKB accelerator, the next-generation B factory located in Tsukuba, Japan, the BEAST II detector system was used to measure beam induced backgrounds. Fast neutrons have proven to be a notoriously pernicious background at collider experiments. Among the many measurements made by BEAST II, the Micro Time Projection Chambers (μTPCs) subsystem provided direction-sensitive measurements of fast neutrons by reconstructing the charge clouds from nuclear recoils in gas with high spatial resolution. We present measurements from the first SuperKEKB run, and compare the resulting data with beam-loss and detector simulations.

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