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## TPC-like readout for thermal neutron detection using a GEM-detector

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Position resolving detection of thermal neutrons combined with timing information and high flux capability are key features of detectors in spallation sources like the ESS. In order to reach the extremely low spatial resolution of less than 200  $\mu\text{m}$  for neutron tomography or radiography novel readout scheme based on the time-projection-chamber (TPC) concept is used in a gaseous electron multiplier (GEM) detector. Thermal neutrons are captured in a single 2  $\mu\text{m}$  thick Boron-10 converter cathode and secondary Helium and Lithium ions are produced with a combined energy of 2.8 MeV. These ions have sufficient energy to form tracks of several mm length.

With a time resolving 2-dimensional readout of 400  $\mu\text{m}$  pitch in both directions, based on APV25 chips, the ions are tracked and their respective origin in the cathode converter foil is reconstructed.

Using n Ar-CO<sub>2</sub> 93:7% gas mixture, a resolution of 100  $\mu\text{m}$  has been observed with a triple GEM-detector setup at the Garching Neutron source (FRMII) for neutrons of 4.7 Å.

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