

ACHINOS: A multi-anode read-out for position reconstruction and tracking with spherical proportional counters

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The spherical proportional counter is a versatile gaseous detector with physics applications ranging from rare event searches to fast neutron spectroscopy. In its simplest form, the detector operates with a single channel readout and uses pulse-shape information to reconstruct the interaction radius, which is used for background discrimination and fiducialisation. Recent developments in the read-out instrumentation have enabled the use of a multi-anode read-out structure, ACHINOS. The multiple anodes provide information about the interaction position that, coupled with the radial information, can be used to reconstruct an ionisation track. This ability has implications for several applications of the detector, for example, background discrimination in rare event searches. Developments in the experimental implementation of ACHINOS will be discussed, along with simulations of the track reconstruction capability using a dedicated simulation framework.

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