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Low Pressure Focal Plane Detectors for the K600 :A design study

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Magnetic spectrometers have proven to be very useful in the world of experimental nuclear and astrophysics. The focal plane detection system instrumenting these spectrometers is instrumental in their success. A new focal plane detection system is envisaged for the K600 QDD magnetic spectrometer at iThemba LABS in Cape Town, South Africa. The existing focal plane detection system, consisting of two multi-wire drift chambers (MWDCs) and plastic scintillators, is designed to detect light ions (H and He isotopes) at medium energies (50-200 MeV). To be detected these particles go through a lot of material before reaching the scintillators and an event is registered. This affects the low energy threshold for operation of the K600. This study will quantify the low energy limitations as well as investigate the material budget for a new low energy detector. A conceptual design for a new focal plane detection system will be explored.

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