

Basic Architectural Design of CPT: Mechanical Design

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Abstract

The mechanical design of CPT is considered. A possible design is illustrated. The main structures of both of the CPT sensors consist of an outer layer of aluminium and an inner layer of tantalum. The thicknesses of the layers are 4 mm (Al) + 2 mm (Ta) in LET and 3 mm (Al) + 3 mm (Ta) in HET. A detailed design of the LET collimator is presented. A disk-loaded collimator is employed in the aperture, where electrons mostly are measured, whereas in the other apertures, used mainly for proton and heavier ion measurements, a sweeping magnet has been inserted.

The principle of the detector mounts is discussed. A design allowing the detectors of each sensor to be assembled in a single integrated unit is described. Finally, the mechanical design of the electronics is considered assuming a conservative configuration of CPT. The improved mass estimates indicate a mass of 1.7 kg for LET, 2.9 kg for HET, and 2.4 kg for the electronics including the box and the baseplate.