

HIGHLY-SEGMENTED DIGITAL TRACKING CALORIMETER FOR PROTON-CT

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Proton CT is a proposed modality for measuring the trajectory and the energy loss of high energy protons through a patient in order to estimate the patient's volumetric proton stopping power. A proton CT can provide higher accuracy in the treatment plan during particle radiation treatment, as well as providing in-room position verification and day-to-day online check of anatomical changes in the beam's path. The proton energy after having traversed the patient is measured by stopping the protons in the calorimeter, identifying the Bragg peak and thus determining the range. A prototype of a compact high-granularity digital tracking calorimeter has been built and was characterized in proton beams. The sensitive layers contain Monolithic Active Pixel Sensors (MAPS chips). Because of the extremely high number of pixels the device will be able to cope with large particle multiplicities, thus providing a breakthrough in rate capabilities. Results on key features of the proton CT calorimeter will be presented as well as the plans for a clinical prototype.