A Simulation study of a totally active dual readout calorimeter

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In this research project, we seek to investigate the simulation and analysis process of a totally active dual readout calorimeter. The analysis of electron e^-, pi meson π^- and muon μ simulations are presented. The dual readout correction process is explained in detail and the results from applying this process to 1, 2, 5, 10, 20, 50 and 100 GeV π^- are shown. The effect of energy threshold cuts on cell energy distributions are shown for the case of minimum ionizing particle (5 GeV muon) and later for a 20 GeV π^-. We show that the fine segmentation of this calorimeter puts constraints on the energy threshold cuts. The energy resolution of the corrected 20 GeV π^- response varied from $\frac{E\ (\sigma)}{E} = \frac{0.11}{\sqrt{E}}$ for no threshold cuts to $\frac{E\ (\sigma)}{E} = \frac{0.5}{\sqrt{E}}$ for a 1 m.i.p. threshold cut.