Abstract Submitted for the DNP06 Meeting of The American Physical Society

Pion efficiency analysis for ALICE Transition Radiation Detector prototypes using an LQ-X method¹ DAVID HERNANDEZ, Institut für Kernphysik, Universität Münster, Germany — One goal of ALICE, the only dedicated heavy-ion experiment at CERN's Large Hadron Collider (LHC), is to study the elusive Quark-Gluon Plasma (QGP), using theoretically predicted changes in the production of particles. Original particles can be reconstructed via their decay electrons. The Transition Radiation Detector (TRD) detects transition radiation from ultrarelativistic electrons, facilitating electron/pion discrimination in momenta ranges above 1 GeV/c. In addition to an increased energy deposit, electrons differ from pions in time signatures, because the transition radiation photons are absorbed in the first instants. The pion rejection is analyzed for 2004 electron/pion beams of momenta 4 to 10 GeV/c, with 6 layers of the TRD, by calculating and combining the two signatures in what is called a bidimensional LQ-X method. Rejection factors increase by more than 10% with respect to a standard energy deposit analysis. The effects on pion rejection of tail cancellations in the signals and amplification regions in the TRD are explored.

¹This work was made possible thanks to a grant from the German Academic Exchange Service

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Date submitted: 28 Jul 2006

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