FAST SIMULATION OF THE UPGRADED PID DEVICE

Rok Pestotnik
J. Stefan Institute

July 30, 2003
PID upgrade meeting

The fast simulation of the PID device will do the following:

- use generated track information as input
- as output return likelihoods for individual particle hypotheses

What was changed with respect to the previous version (05/29 meeting)?

$\rightarrow$ Digitization, reconstruction: out ($\rightarrow$ full simulation)

The program becomes much faster.

Timing

Reference machine f9pc43.ijs.si
vendor id : AuthenticAMD
model name : AMD Athlon(tm) XP processor 2100+
cpu MHz : 1733.470
cache size : 256 KB
RAM : 512MB
OS: RedHatLinux 8.0 kernel Linux release 2.4.18
compiler: gcc version 2.95.2

05/29 status
CPU usage for 10000 events:
Total 12.12 s

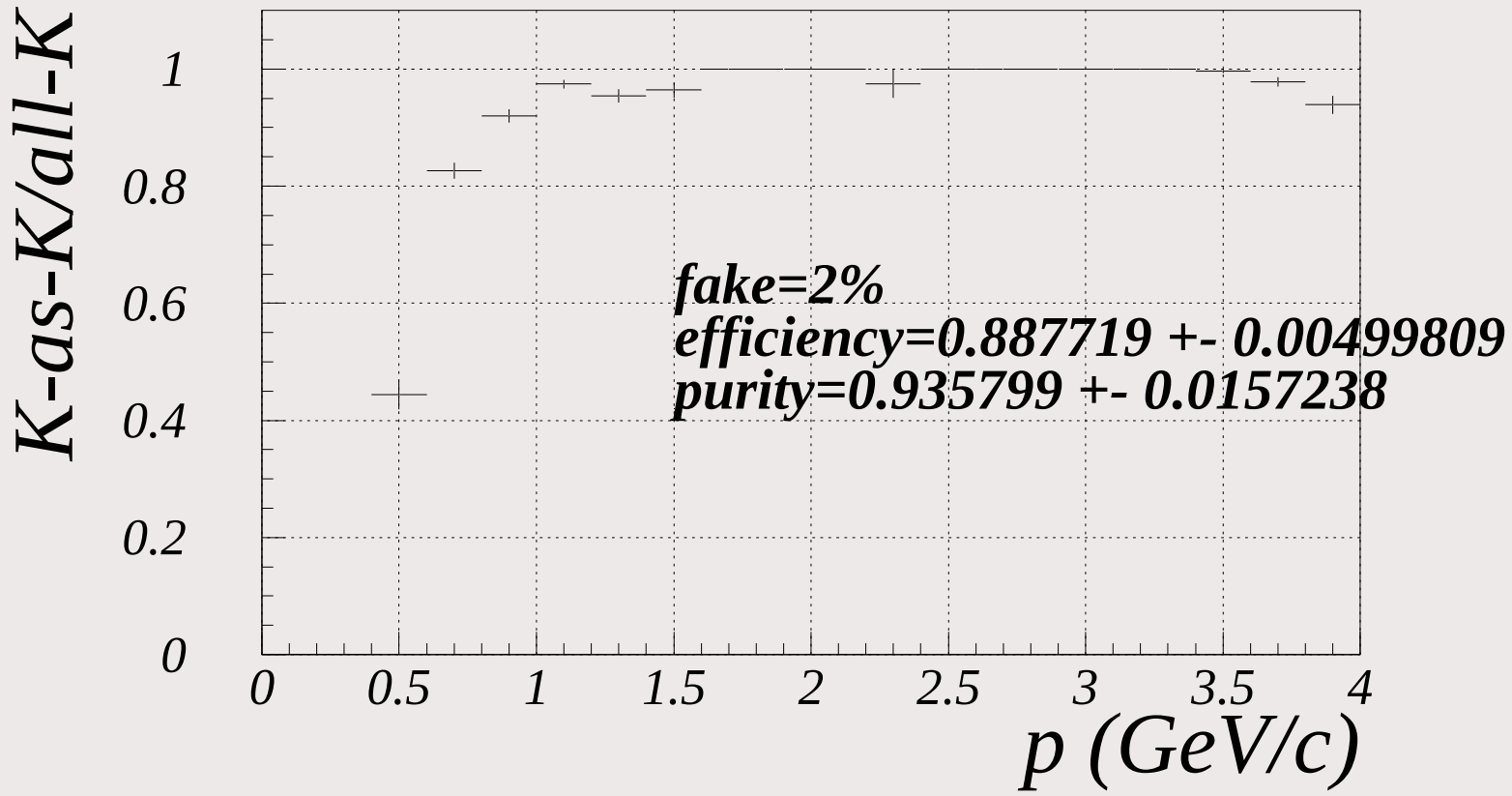
→ not fast enough

07/30 status:

CPU usage for 10000 events:
Total fast simulation 0.74 s

Fast simulation, some results

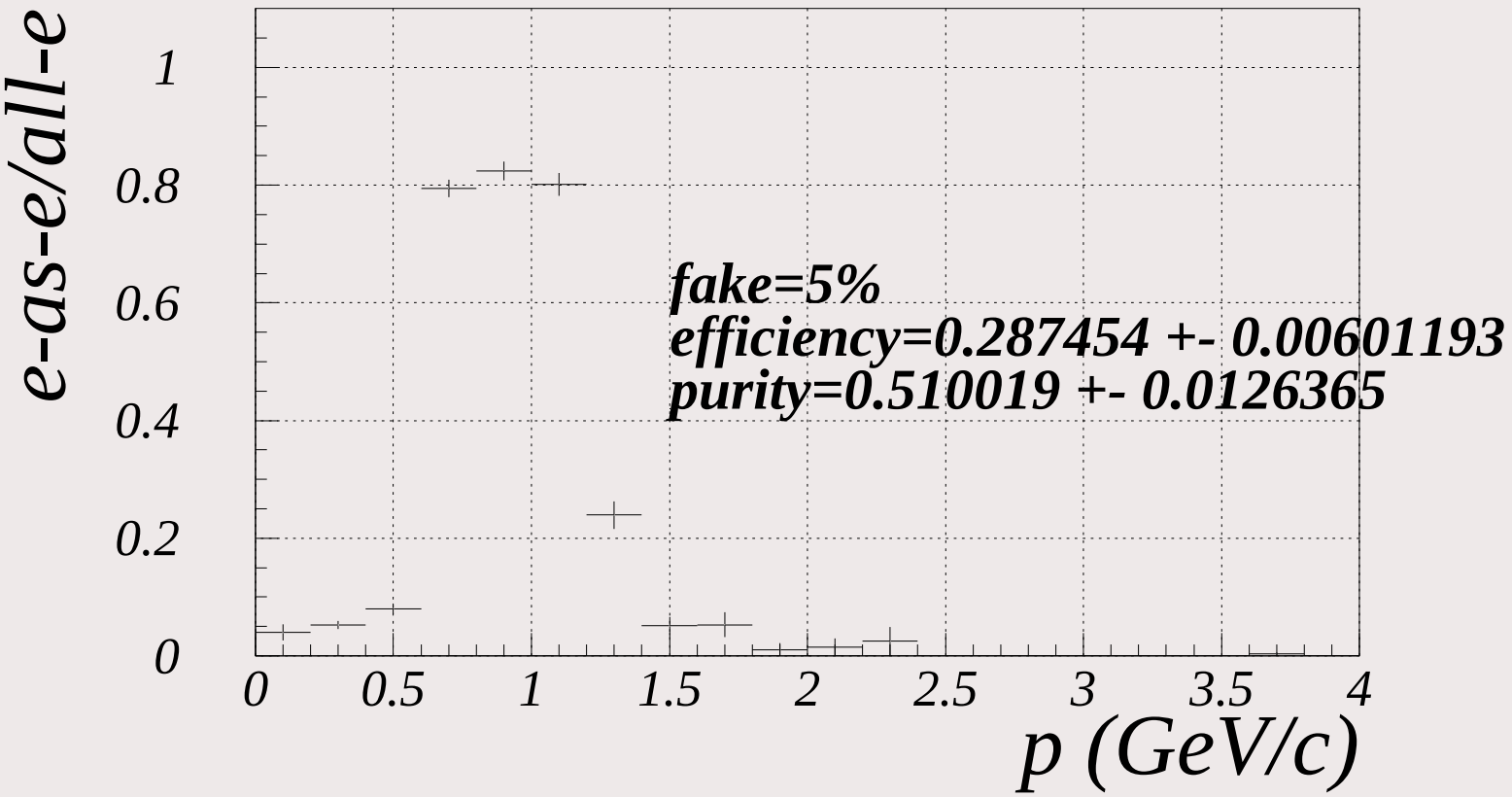
π/K separation

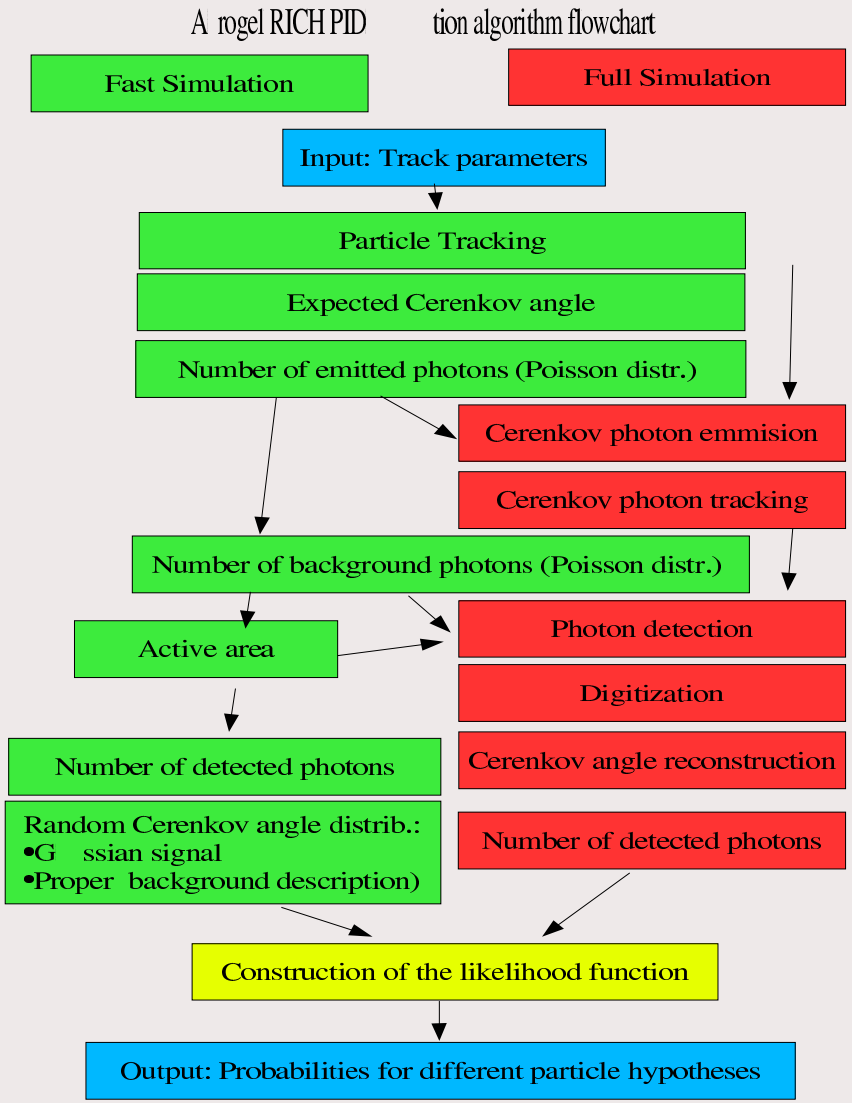


Fast simulation, some results

UNIVERZA V LJUBLJANI

π/e separation




A rogel RICH PID tion algorithm flowchart
Fast Simulation
Full Simulation
Input: Track parameters
Particle Tracking
Expected Cerenkov angle
Number of emitted photons (Poisson distr.)
Cerenkov photon emmision
Cerenkov photon tracking
Number of background photons (Poisson distr.)
Active area
Photon detection
Digitization
Number of detected photons
Cerenkov angle reconstruction
Random Cerenkov angle distrib.:
•G ssian signal
•Proper background description)
Number of detected photons
Construction of the likelihood function
Output: Probabilities for different particle hypotheses

Timing, full simulation

Reference machine f9pc43.ijs.si
vendor id : AuthenticAMD
model name : AMD Athlon(tm) XP processor 2100+
cpu MHz : 1733.470
cache size : 256 KB
RAM : 512MB
OS: RedHatLinux 8.0 kernel Linux release 2.4.18
compiler: gcc version 2.95.2

05/29 status
CPU usage for 10000 events:
Total 12.12 s

$\rightarrow$ can be improved

07/30 status:

CPU usage for 10000 events:
Total 4 s