Physics Analysis Status

LNF Alice Weekly Meeting
February 21th, 2017.

Silvia Pisano

Outline

- Update on the $\varphi \rightarrow KK$ analysis

  1. Track cut implementation still in progress

  2. Ongoing discussion with software experts to get technical information about the content of ntuple

  3. AOD vs. ESD file

- Analysis activity in Frascati with Paula, Marco and Pavel

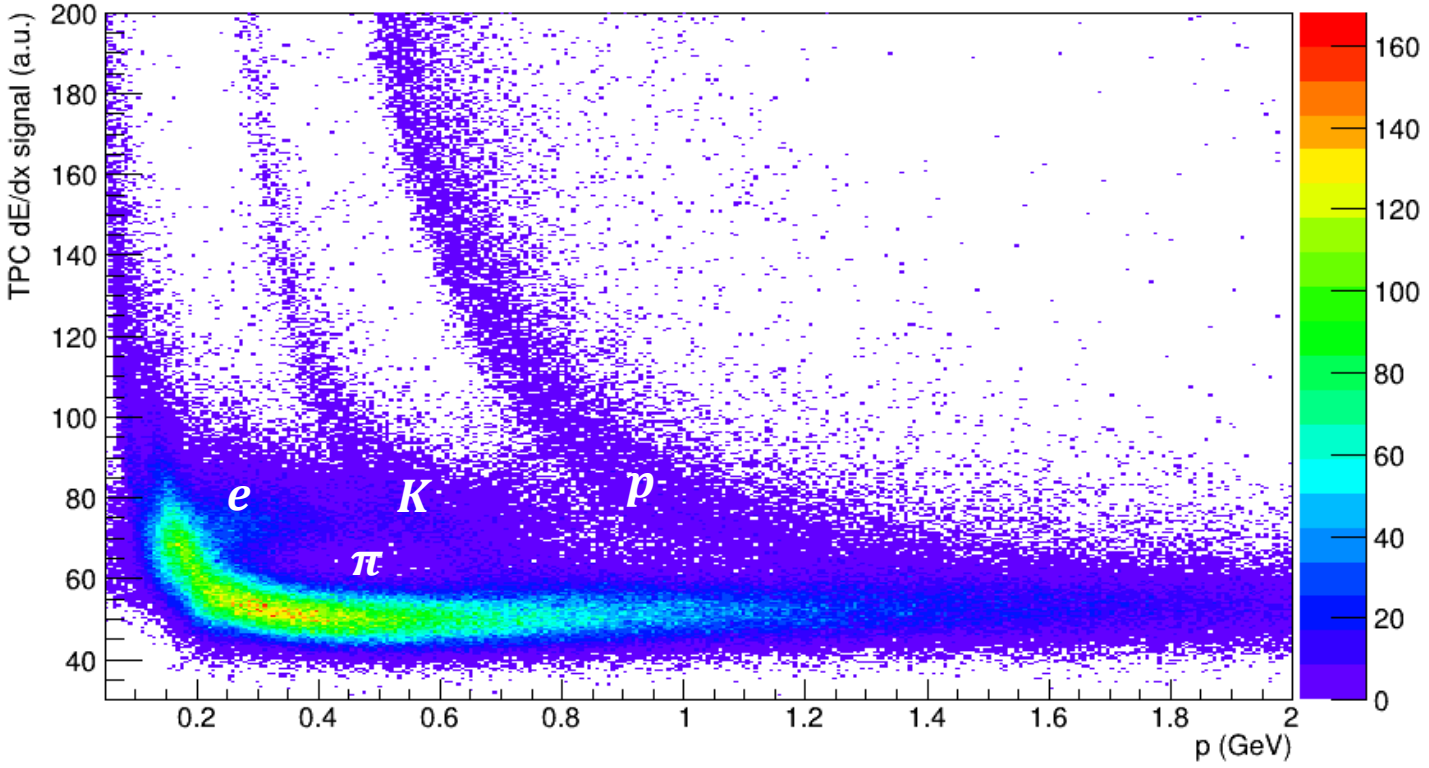
- FARM in Frascati?

- International Master Classes

Steps toward $\varphi \rightarrow KK$ reconstruction

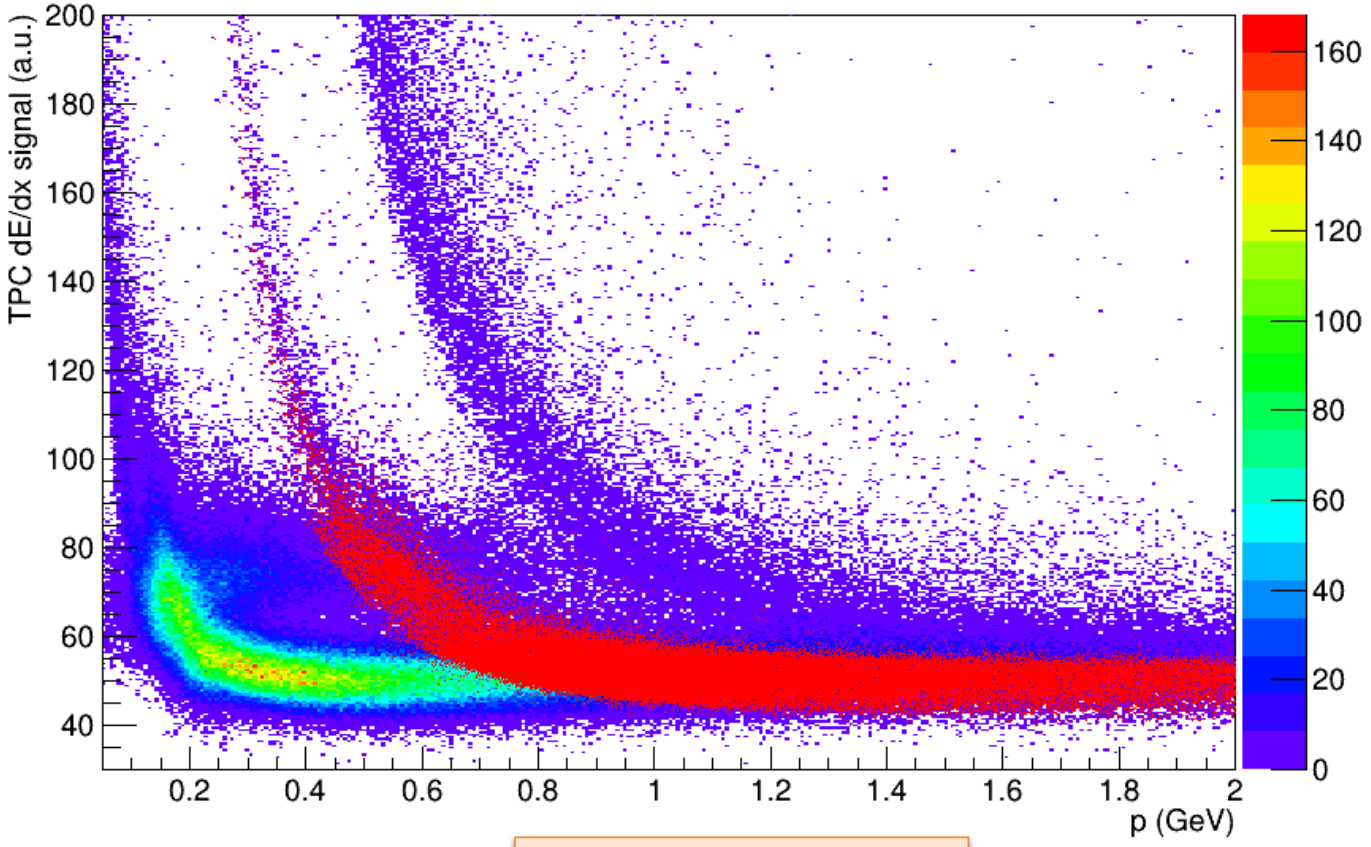
1. track selection (TPC based)
2. ⇒ implement the particle identification algorithm through the dE/dx information
3. ⇒ parametrization of the expected $dE/dx \ \ vs. \beta\gamma$ dependence as a function of the mass hypothesis (Bethe-Block based)
4. cut efficiencies (cut-flow analysis) -> track identification through other detectors in progress (ITS&TOF, and combined Bayesian approach)
5. Reconstruction of φ through the invariant mass of the two charged kaons
6. Signal extraction: signal + background fit, background modeling, data/MC comparison
7. Reproduction of the analysis on ESD files (PID cut variations)

Particle Identification through TPC dE/dx



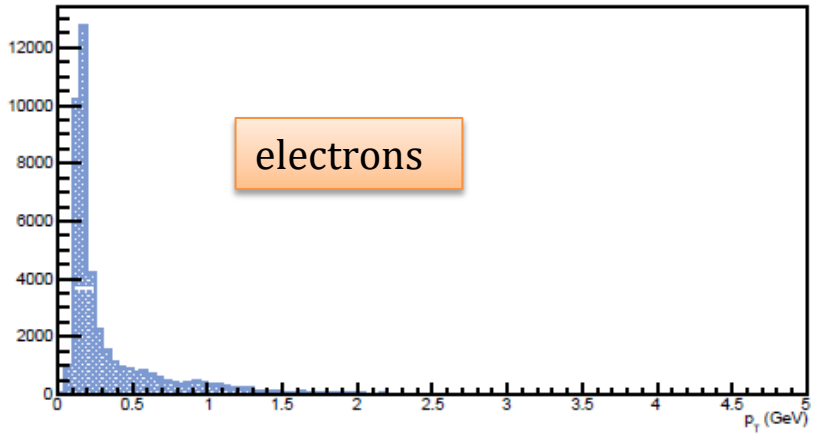
Plot from last meeting

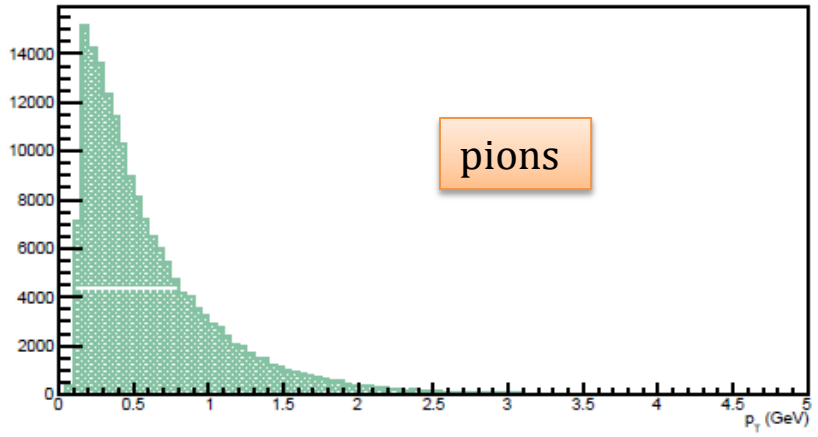
TPC dE/dx: testing kaon hypothesis

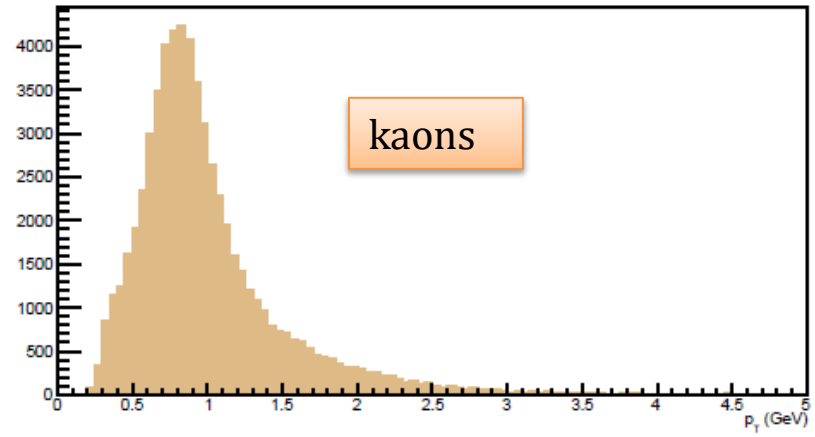


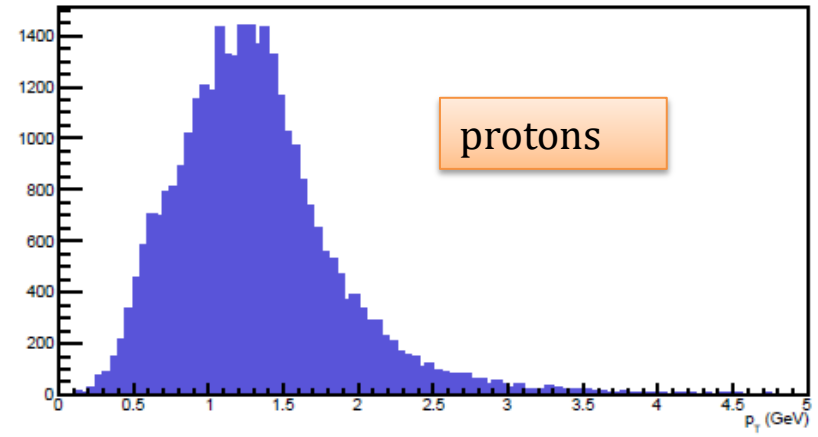
Plot from last meeting

p_T spectra (only TPC-based identification)



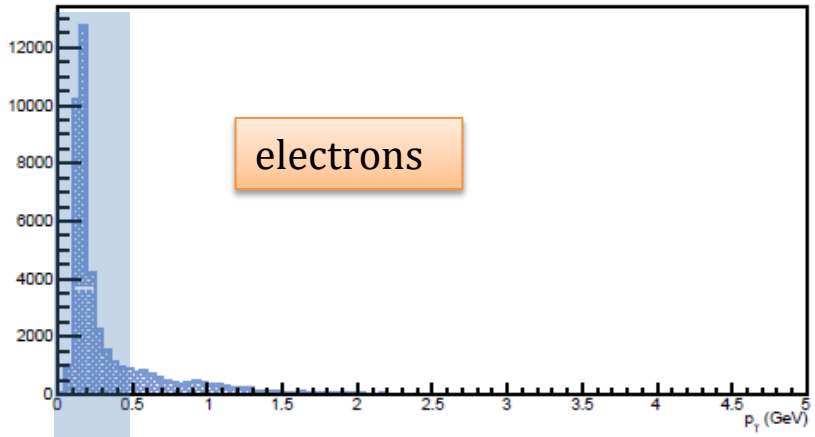


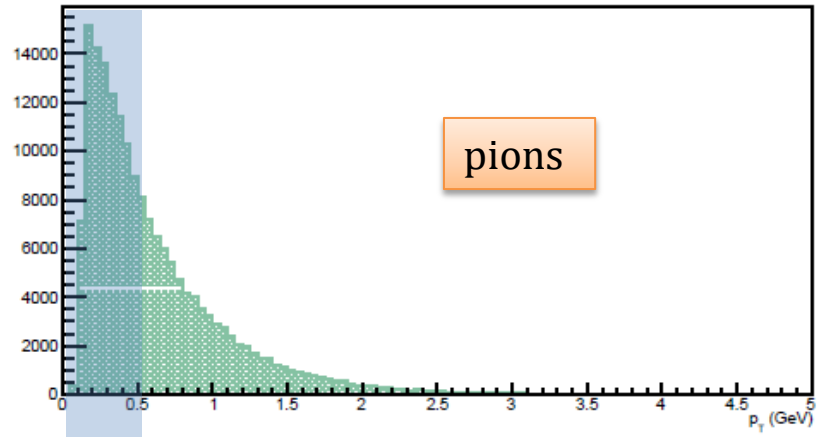


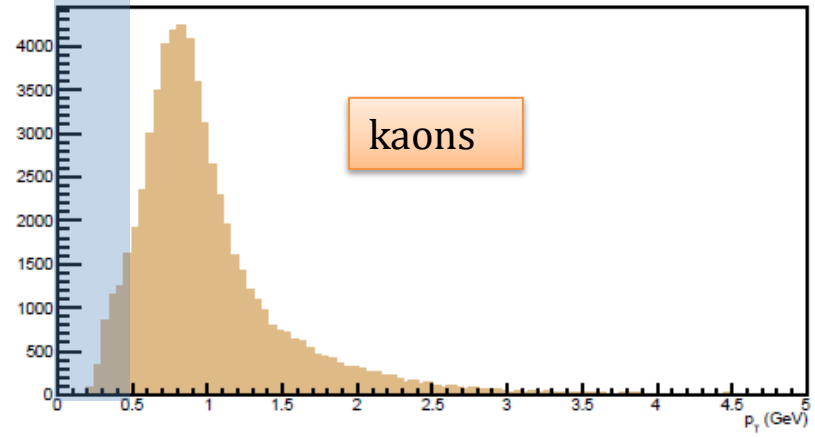


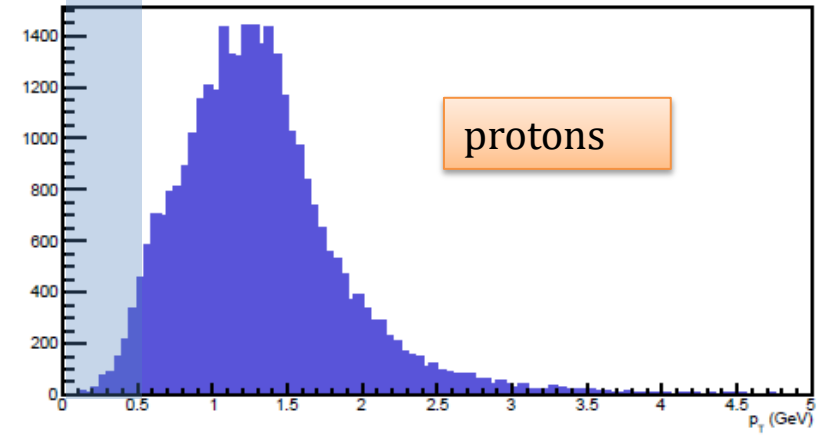
p_T spectra (only TPC-based identification)

ITS will play a major role in the low-p_T region



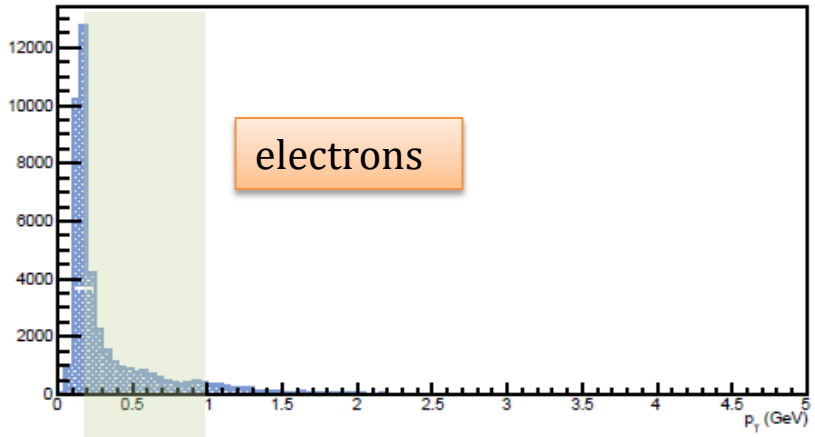


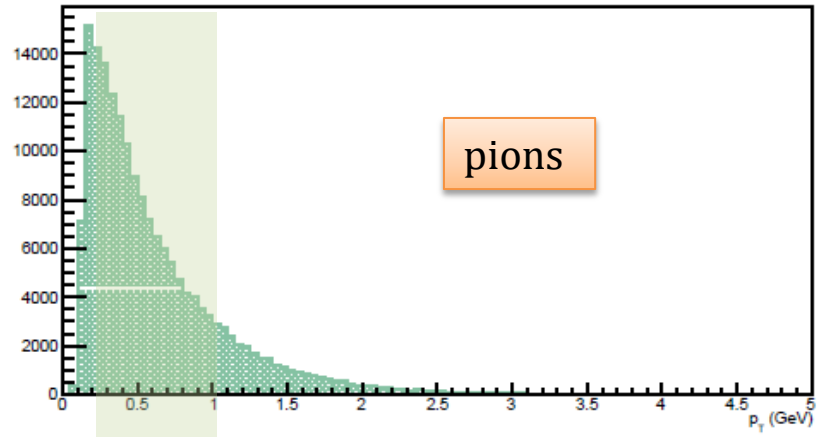


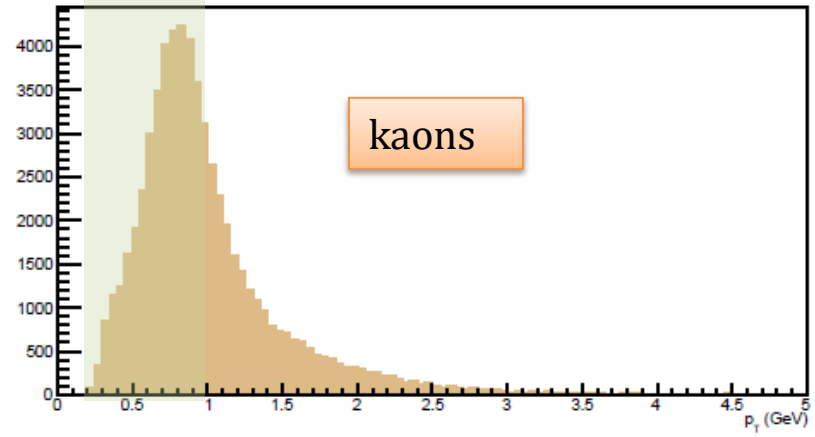


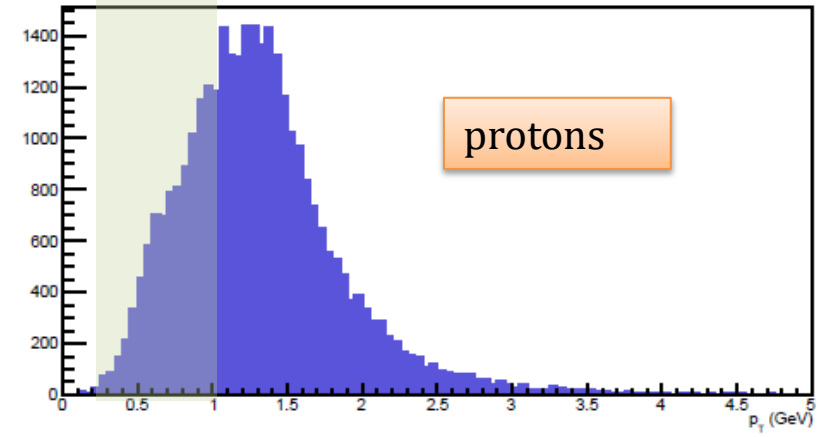
p_T spectra (only TPC-based identification)

TPC provides good separation up to $p_T < 1\ GeV$



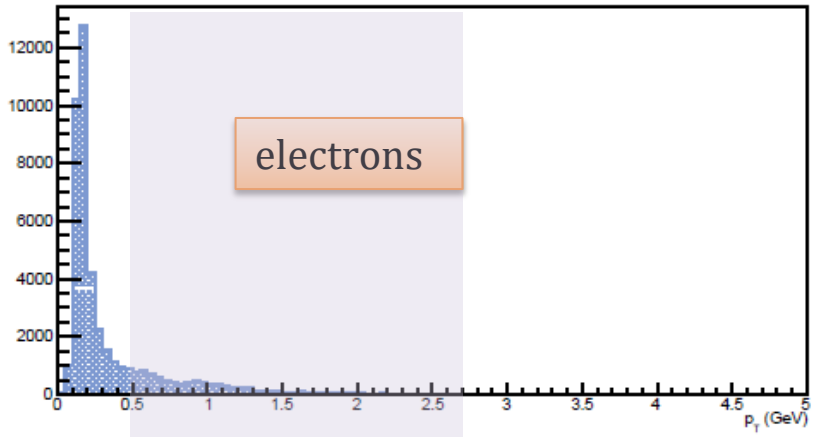


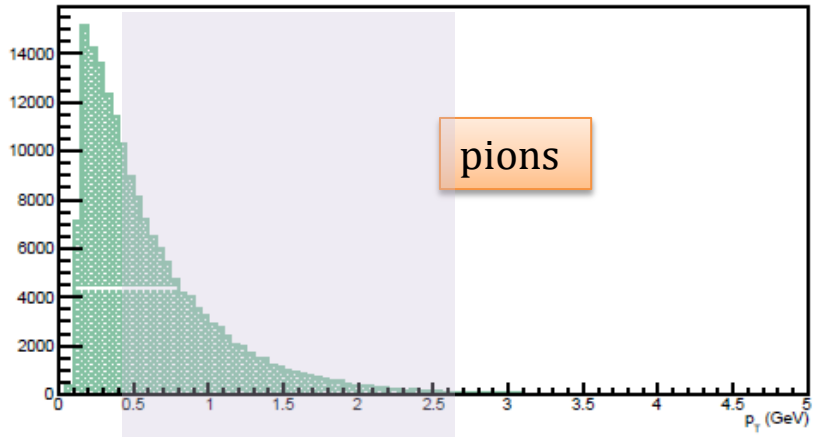


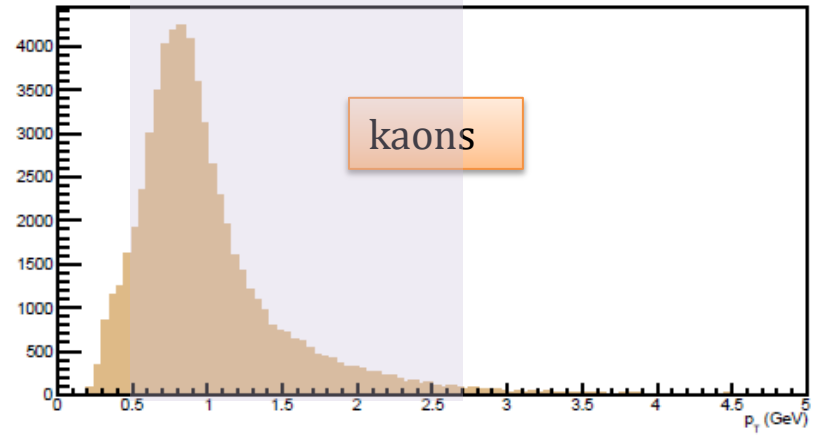


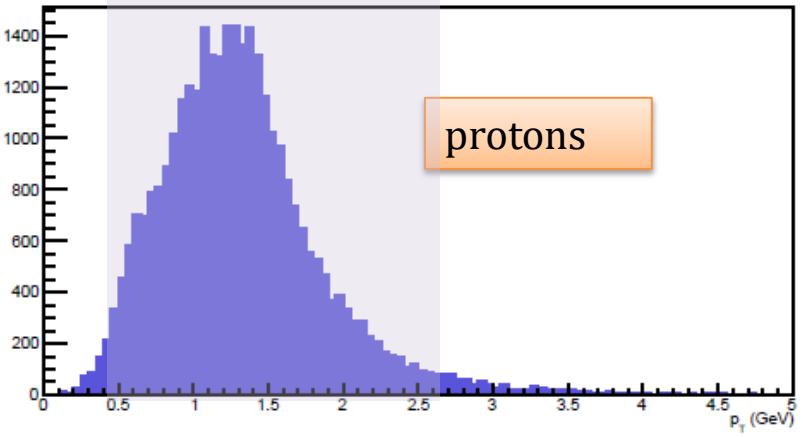
p_T spectra (only TPC-based identification)

TOF extend the separation up to $p_T < 2.5 \div 3\ GeV$ (depending on the particle)



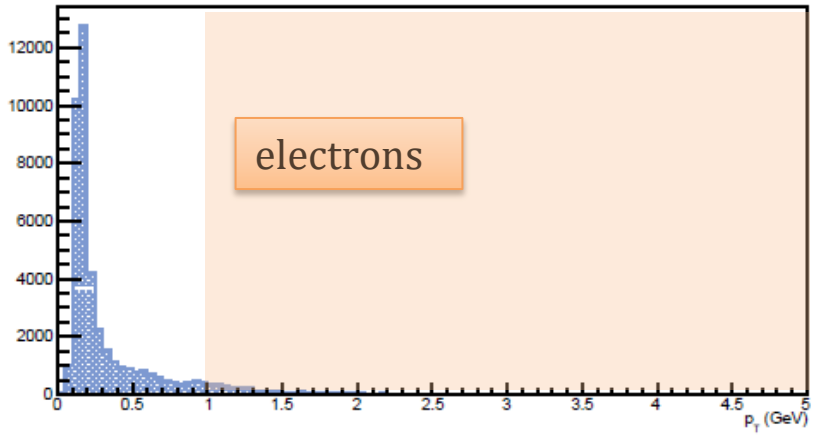


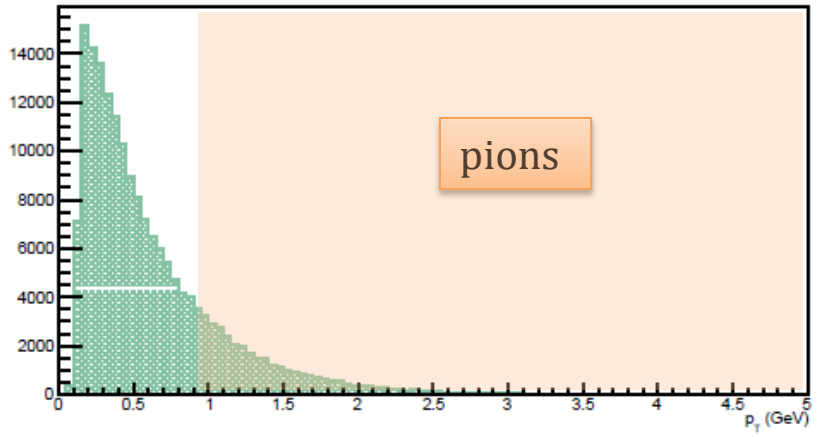


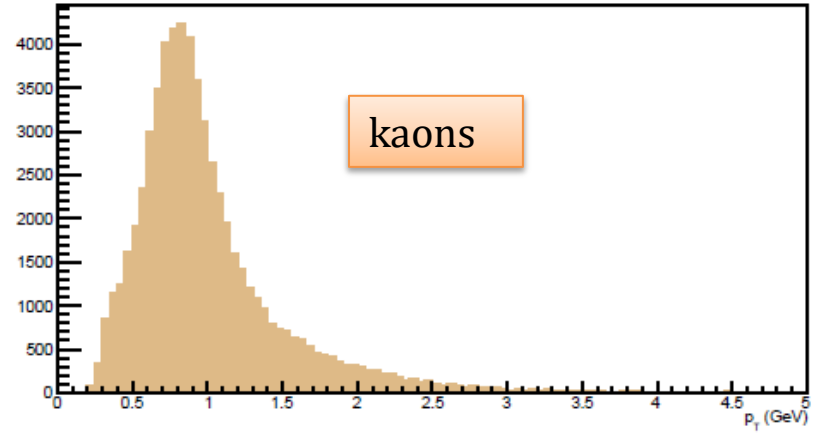


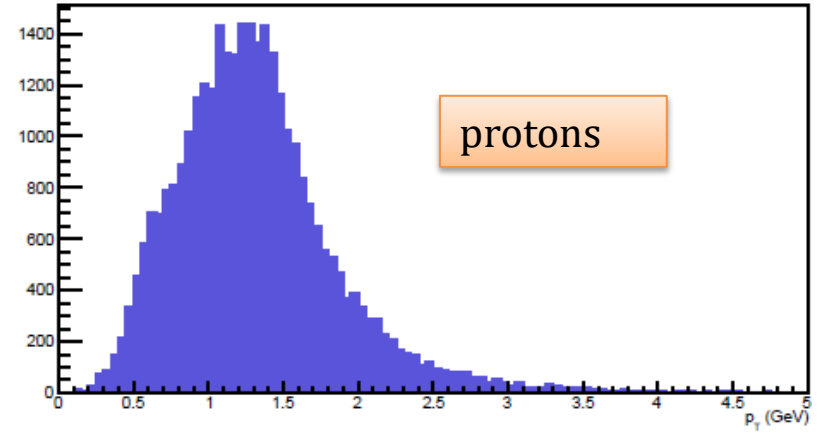
p_T spectra (only TPC-based identification)

TRD will separate electron and pion for $p_T > 1\ GeV$



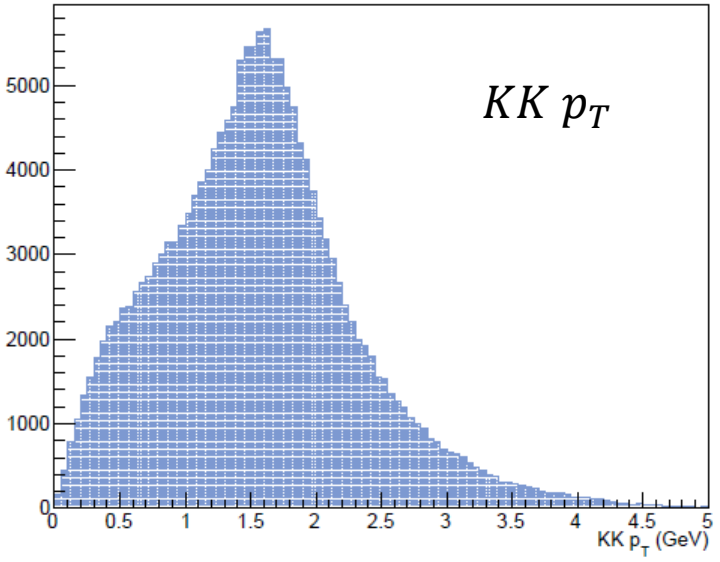


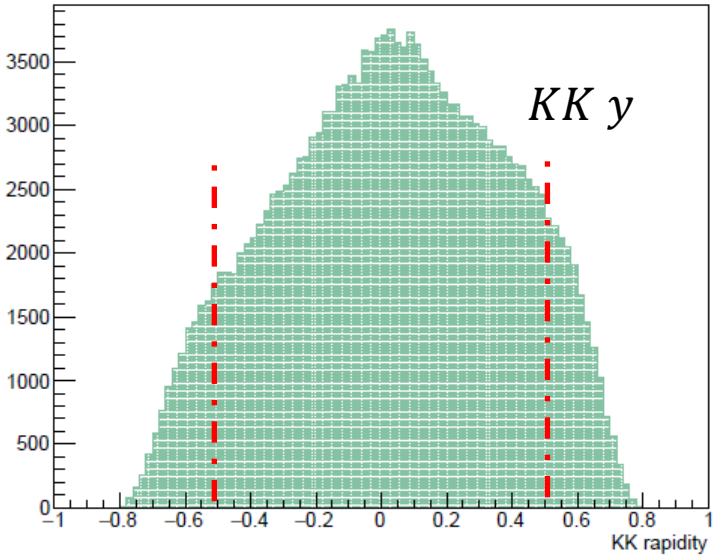




KK sistem kinematics

- for any event, all the charged kaons (identified through the TPC) are stored
- ALL the K^+K^- COMBINATIONS (*unlike-charge* pairs) are considered
- a φ candidate is produced by summing the K^+K^- four-vectors
- the same has to be done on *like-charge* pairs to study background





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- **Analysis activity in Frascati with Paula, Marco and Pavel**

- FARM in Frascati?

- International Master Classes

ALICE-LNF Twiki Page

ALICE-LNF Twiki Page is at the link

https://twiki.cern.ch/twiki/bin/view/ALICE/INFN-Frascati

and can be accessed from the main ALICE Twiki

https://twiki.cern.ch/twiki/bin/view/ALICE/WebHome

from

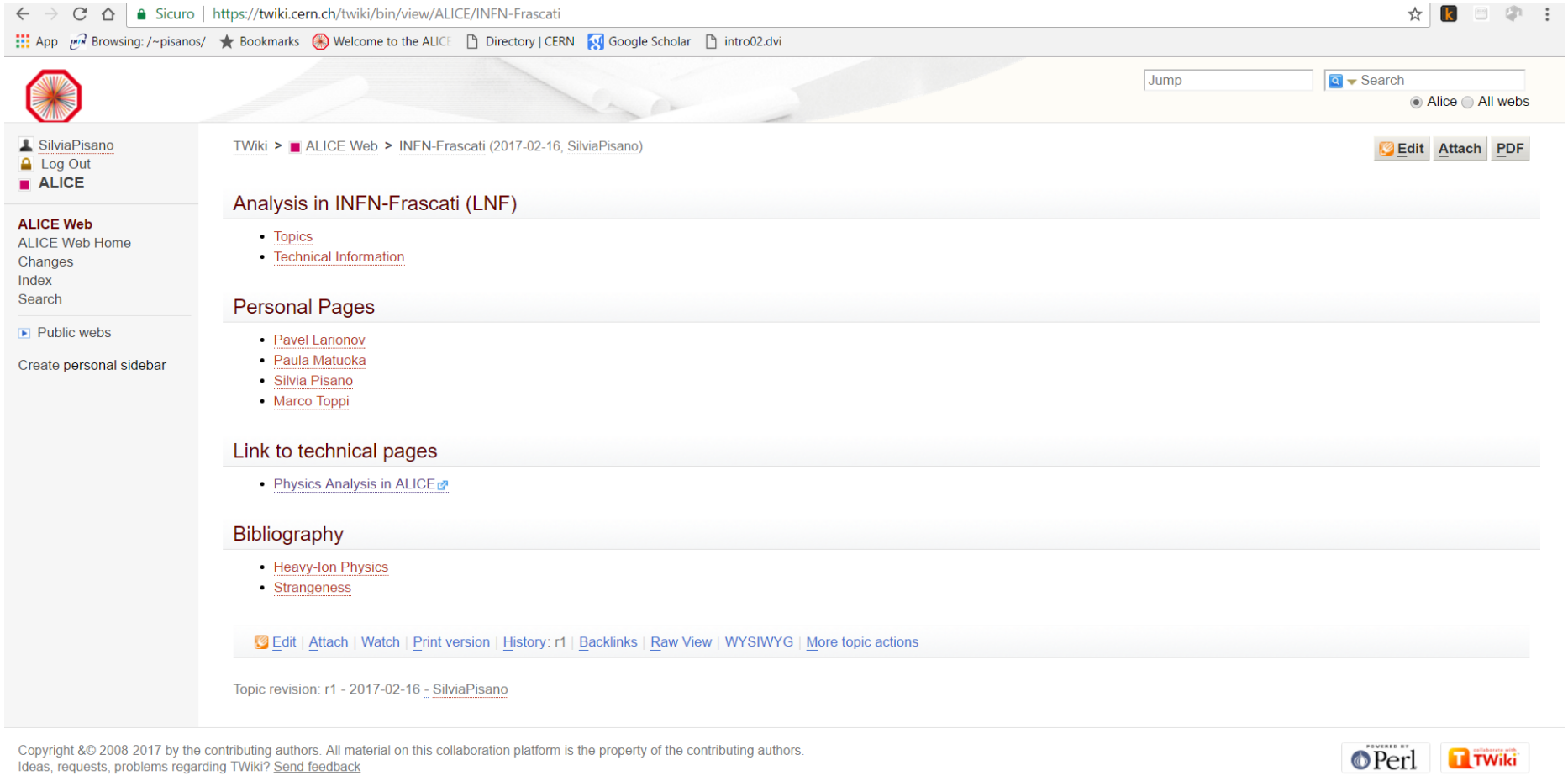
Analysis Groups in Institutes ⇒ INFN-Frascati

Personal pages have been created (if you want to be added, let me know…or just do it yourself! ANY ALICE member can EDIT the page)

To get familiar with Twiki editing visit the tutorial page:

http://twiki.org/cgi-bin/view/TWiki/TWikiTutorial

ALICE-LNF Twiki Page



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International MasterClasses

http://physicsmasterclasses.org/

Tutorial for moderators: Wednesday, Feb 22, 10-12, in 40-S2-C01 (Salle Curie)

backup

Technical info (data set, trigger…)

Title of Note:	ϕ **resonance production in pp collisions at** $\sqrt{s_{NN}} = 2.76$ **TeV (2011 data)**
Objective:	**The objective of this note is to support the final approval of the analysis described herein.**
Primary Authors:	**Martin Vala and Jan Musinsky, Slovak Academy of Sciences Institute of Experimental Physics (IEP), Kosice**
AliRoot version:	**for analysis of real data: v5-05-40-AN; for analysis of simulation data (efficiency): v5-05-40-AN**
Data Samples Used:	real data: **LHC11a, pass 4 without SDD, ESD, AliRoot v5-02-Rev-09**
	simulation: **LHC12f1a and LHC12f1b, ESD, AliRoot v5-02-Rev-34**
Event Selections:	**Standard Physics Selection (AliVEvent::kMB),** $\lvert v_z \rvert < 10\,cm$
Detectors:	**ITS, TPC**
Description of cuts: track selection:	**Standard quality cut 2010, kaon selection: TPC PID**

https://aliceinfo.cern.ch/Notes/sites/aliceinfo.cern.ch.Notes/files/notes/analysis/musinsky/2014-Jan-17-analysis_note-phi_pp_2.76_v2.pdf