

HBT analysis with UNICOR

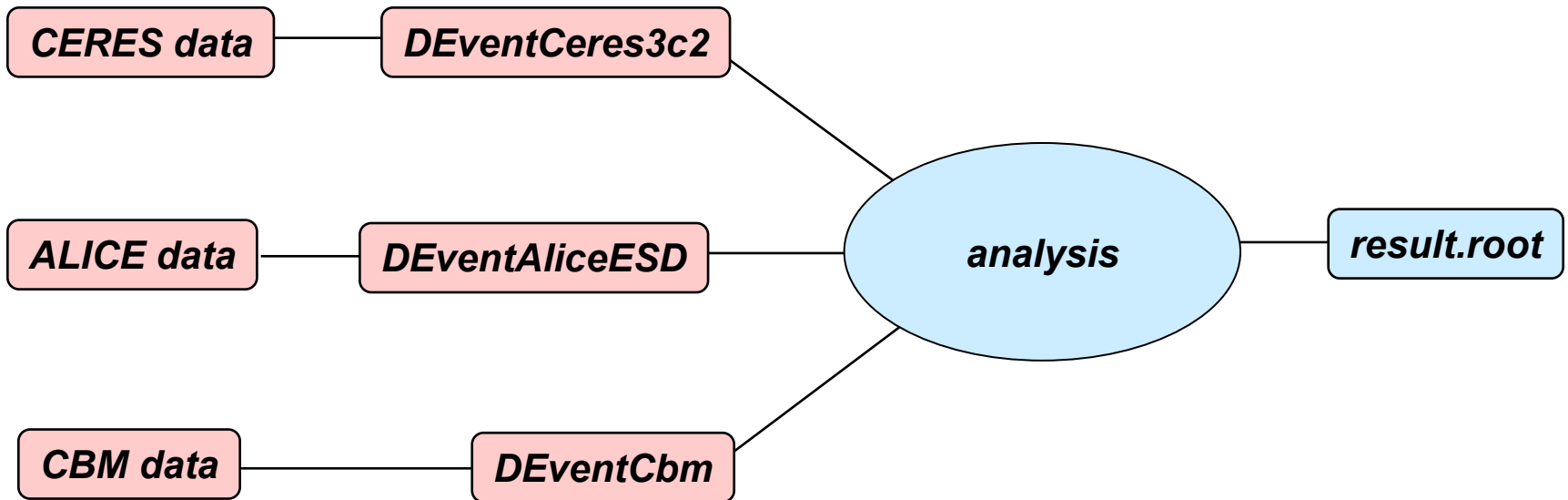
Dariusz Miśkowiec

Rauischholzhausenschlossarbeitstreffen 06-May-2009

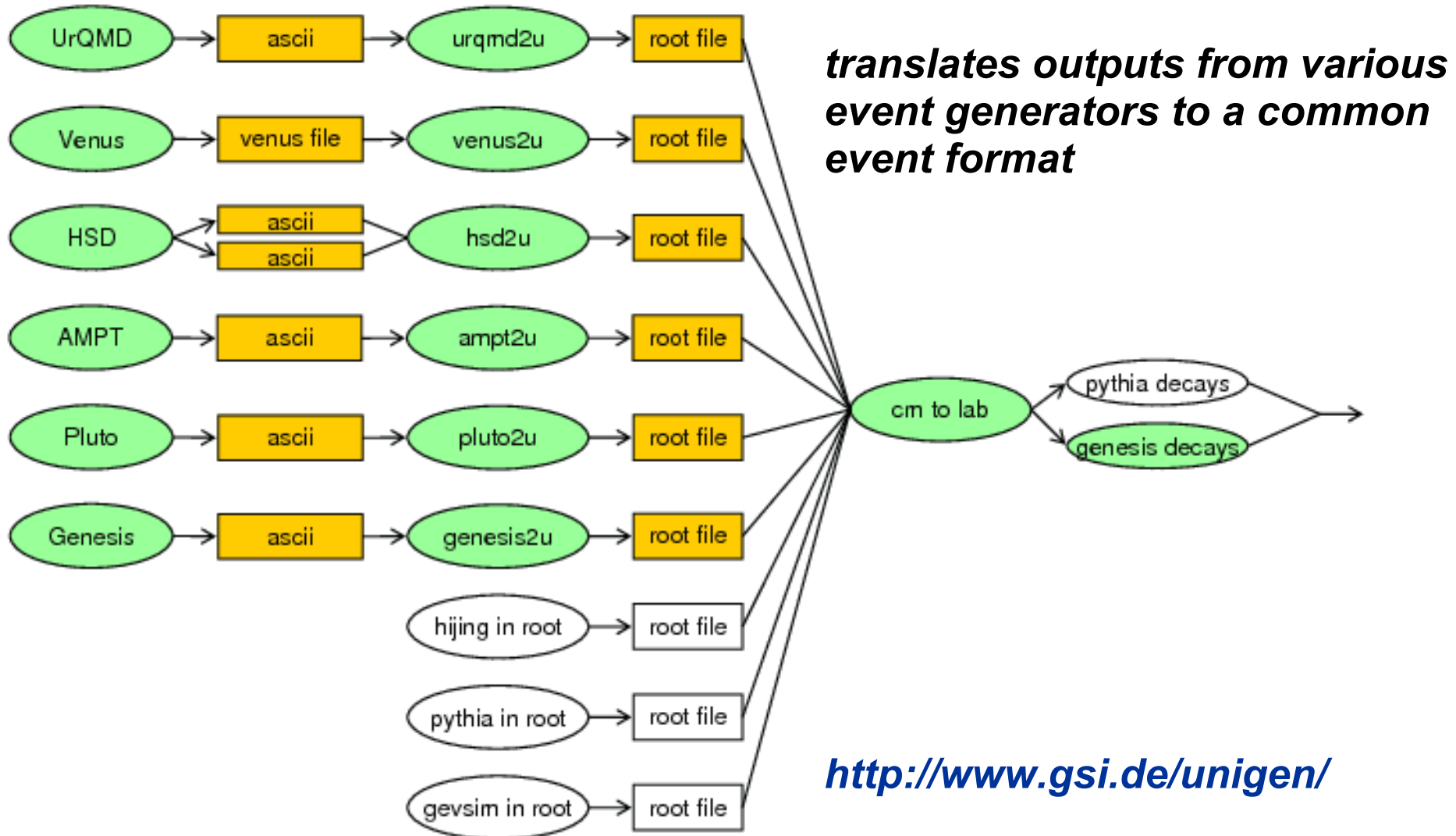
UNICOR is

- ☼ *simple correlation analysis package in C++ and root*
- ☼ *based on my E877 and CERES experience*
- ☼ *experiment independent*
- ☼ *distributions stored in multidimensional histograms*

experiment independence - implementation

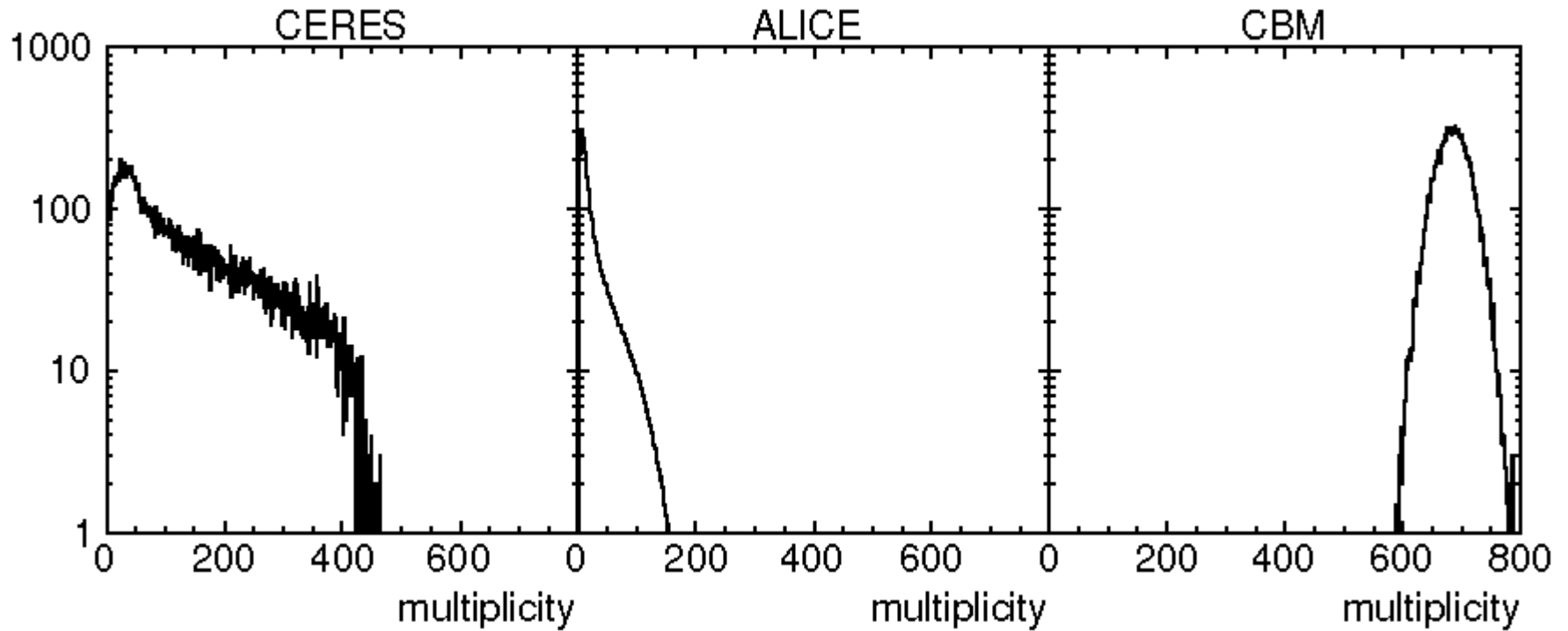


United Generators project at GSI, 2005-2009

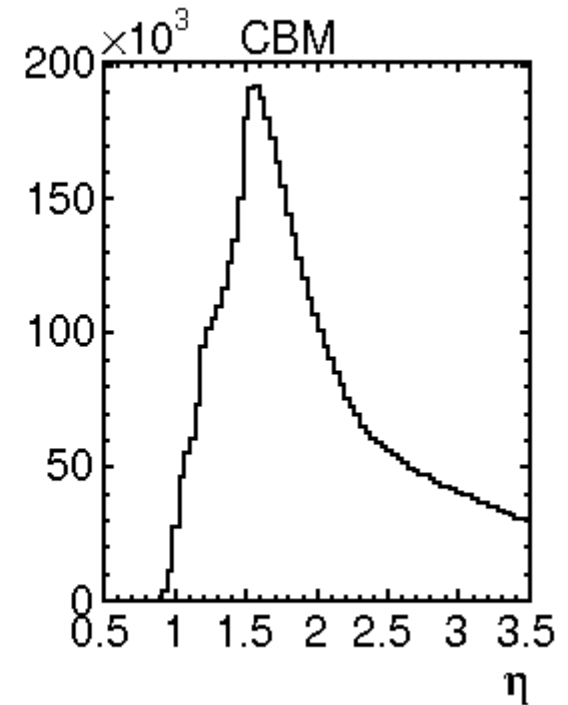
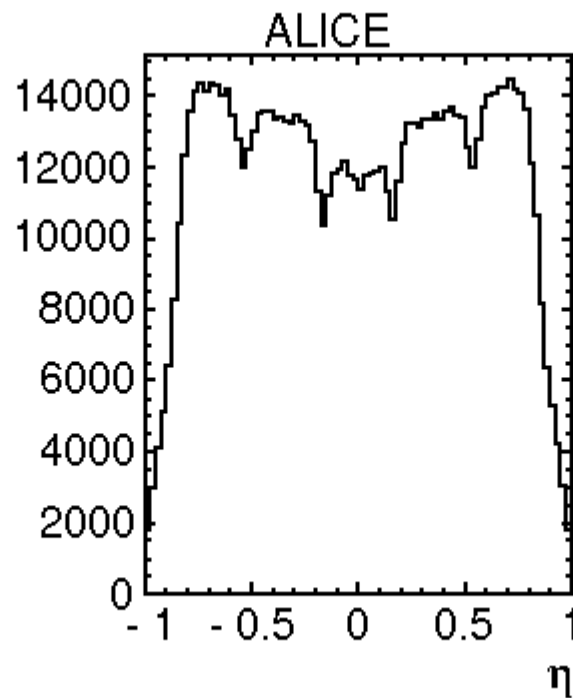
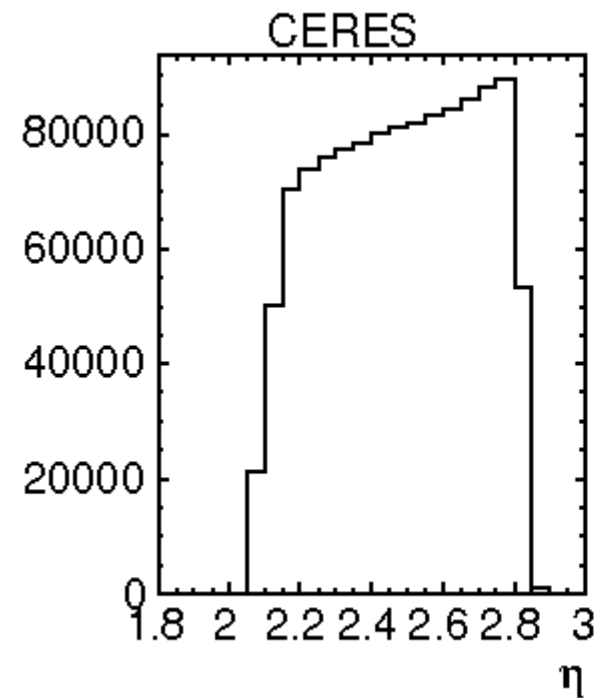


examples of results

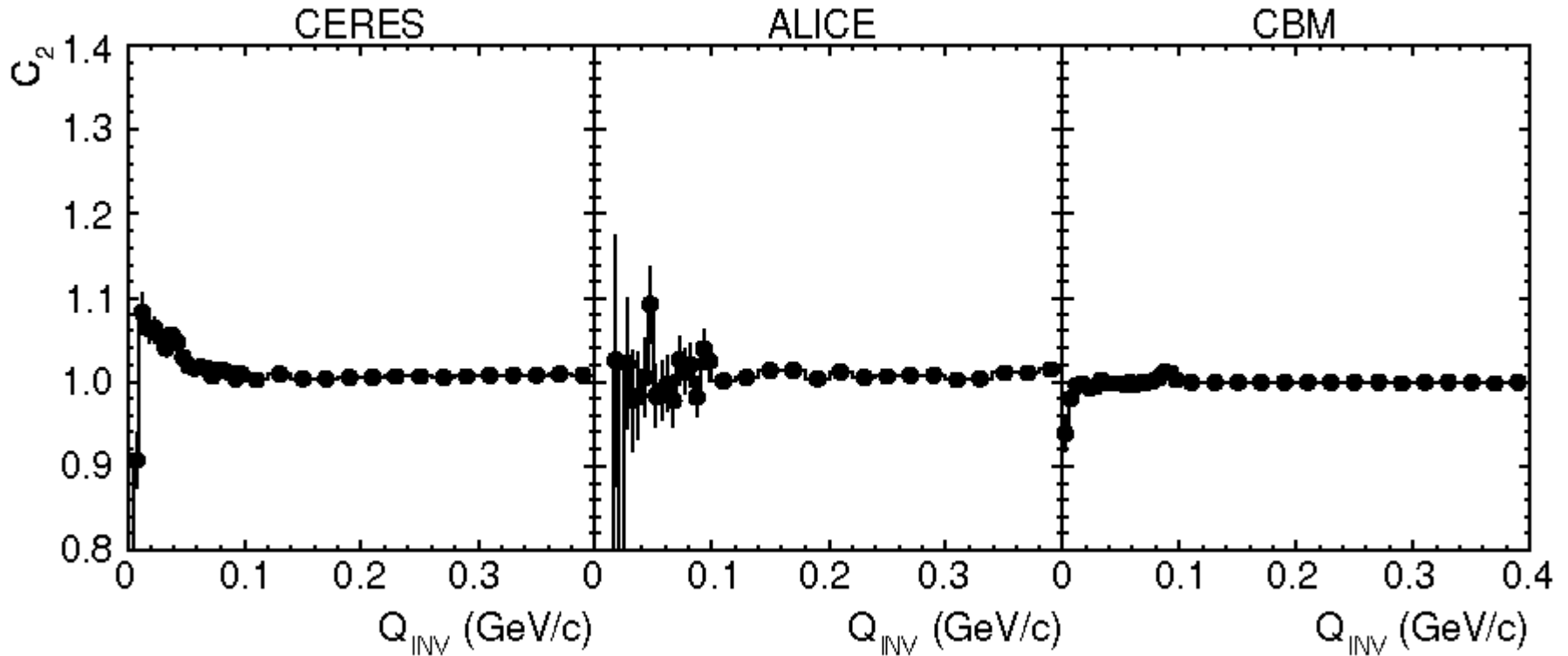
multiplicity



identified pion tracks



two-pion correlations



UNICOR summary

main features

- ☼ *experiment independent*
- ☼ *uses multidimensional histograms (not discussed here)*
- ☼ *simple*

status

- ☼ *running but cuts and methods need to be tuned*
- ☼ *inclusion in the ALICE svn repository in progress*

backup

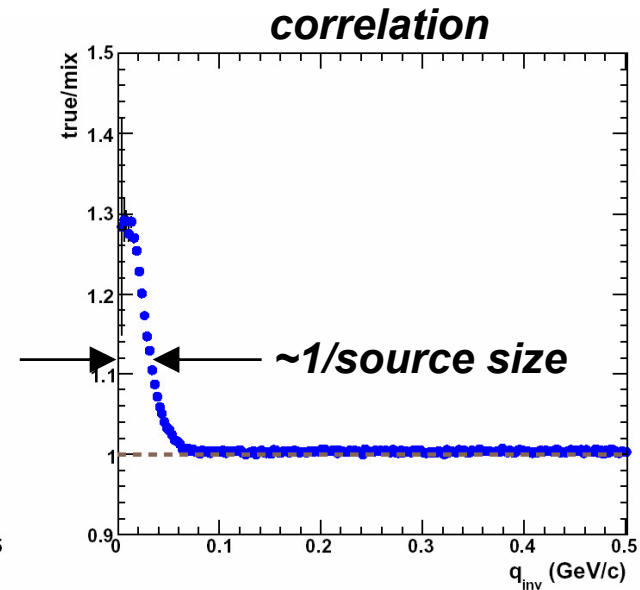
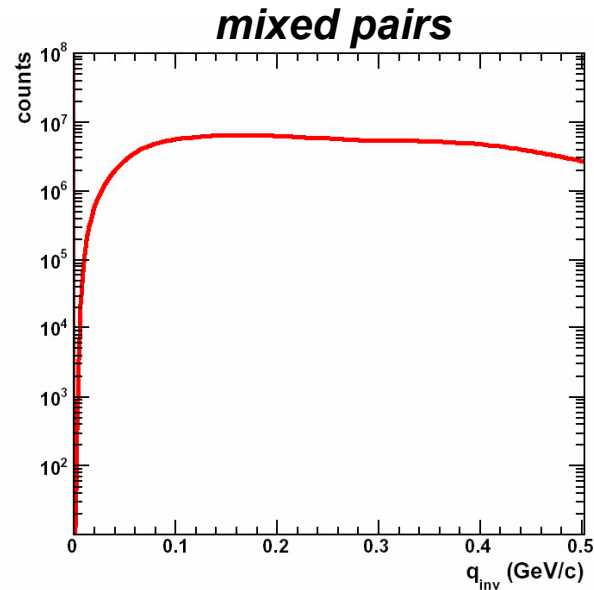
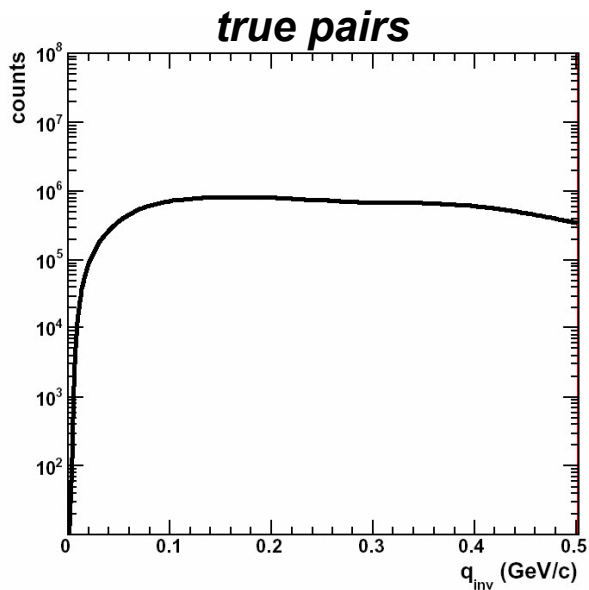
the simplest HBT analysis

D. Antonczyk, thesis intro

- loop over events
- make pi-pi- pairs
- fill a p2-p1 histogram

- mix events
- make pi-pi- pairs
- fill a p2-p1 histogram

- divide tru/mix



momentum difference p2-p1
in pair c.m.

experiment independence - motivation

HBT analysis involves:

- ⊗ ***particle momentum and id***
- ⊗ ***event, track, pair cuts***

} ***10% is experiment specific***

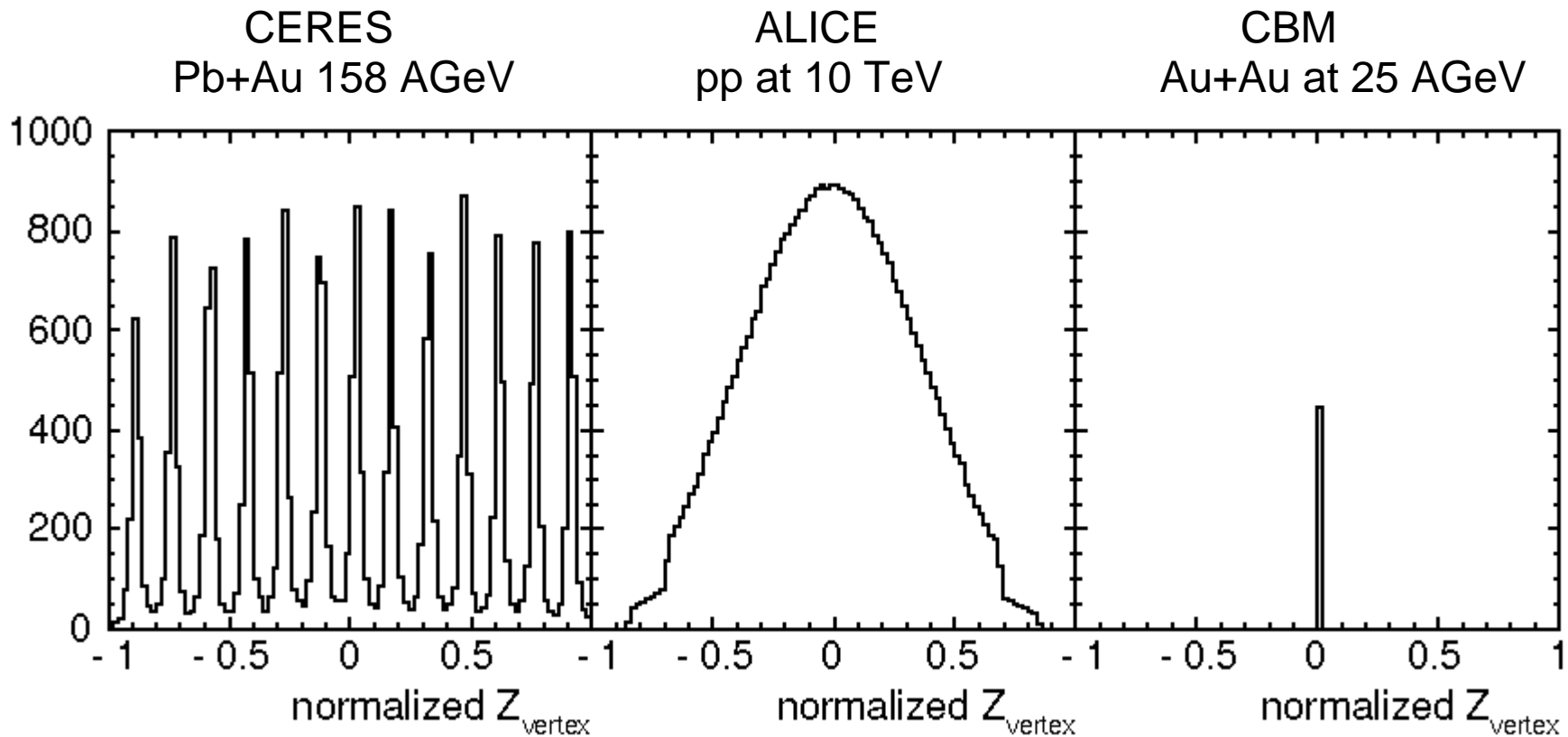
- ⊗ ***pairing, event mixing***
- ⊗ ***kinematics***
- ⊗ ***histogramming***
- ⊗ ***projecting, fitting***
- ⊗ ***Coulomb correction***
- ⊗ ***momentum resolution correction***
- ⊗ ***analysis of HBT radii etc.***

} ***90% independent on particular experiment***

Resulting correlation functions are stored in an 8-dimensional histogram

| | |
|---|-----------------------|
| <i>tru/mix/rot</i> | <i>3 bins</i> |
| <i>centrality</i> | <i>5 bins</i> |
| <i>pair y</i> | <i>4 bins</i> |
| <i>pair phi wrt. event plane</i> | <i>8 bins</i> |
| <i>pair pt</i> | <i>7 bins</i> |
| <i>q-polar angle</i> | <i>8 bins</i> |
| <i>q-azimuthal angle</i> | <i>16 bins</i> |
| <i>q-magnitude</i> | <i>64 bins</i> |

event vertex z-position



event variables: flow vector

