ϕ–>KK analysis update
July 27, 2006

- Event selection:

  MRS trigger, $|z_{vertex}| < 40$ cm, centrality = 0-100%

MRS Angle	B current	Nevent
40	1050	12.1M
40	2255	11.4M
45	1050	4.5M
45	2255	5.1M
90	1050	8.3M
90	2255	3.4M

Total: 44.8

- Track selection:

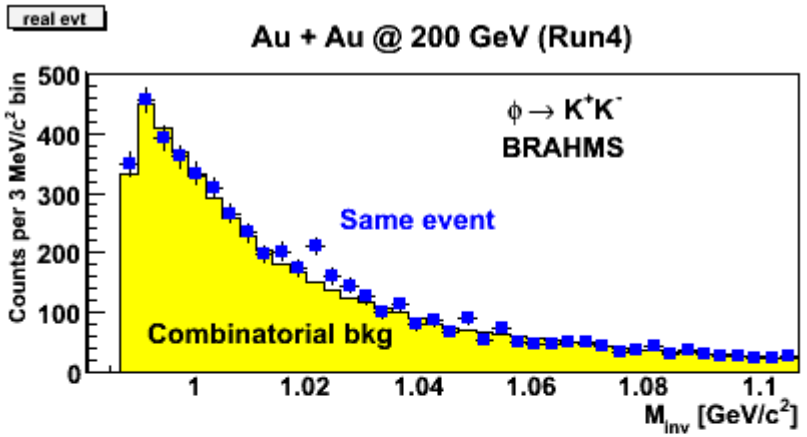
  MRS tracks, $0.3 < p$ (GeV/c) < 5

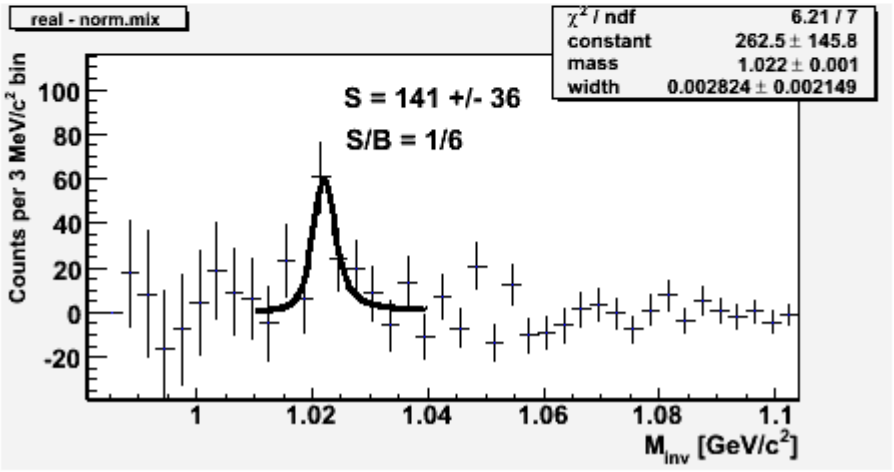
  $0.2 < mass^2 < 0.3$ GeV^2/c^4

  No two tracks share the same hit at TOFW

Invariant mass spectra - I

MRS angle = 40 deg, B Current = 1050





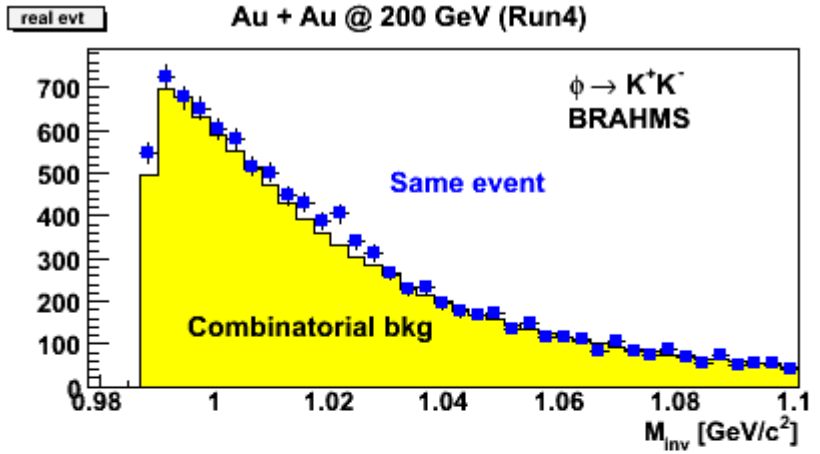
- Same event K+K- spectrum
- Mixed event:

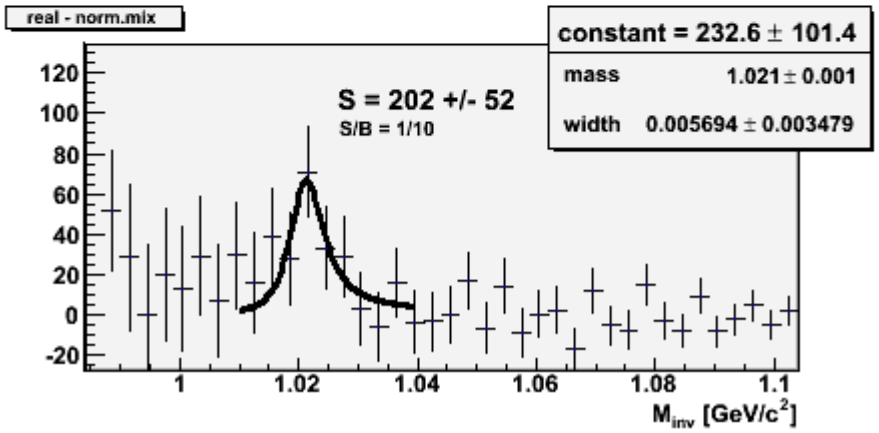
  Each K+/- in one event is combined with each K-/+ in next 10 events within same centrality and vertex bins.
- Mixed events are normalized to the same event at m > 1.2 GeV
- Spectrum is fitted with Relativistic Breit Wigner distribution.
- Signal is extracted by counting the yield in the subtracted spectrum within a mass window of 1.013 – 1.031 GeV

  ==> <Mass> - 3 x width

Invariant mass spectra - II

All possible MRS angle/B current setup





- Derived same event and mixed events for 40 deg, 45 deg and 90 deg each with currents 1050 and 2255.
- Normalized mixed events each of these setups separately.
- Added subtracted spectra algebrically.
- Signal is extracted by adding yields in the subtracted spectrum over the same range as before:

  1.013 – 1.031 MeV

Summary and next steps

- ϕ –> KK peak is clearly observed in BRAHMS at MRS from Run-4 200 GeV Au+Au data.
- More than 200 phi mesons have been reconstructed within MRS with S/B ratio ~ 1/10.

  About 140 phi mesons have been reconstructed at MRS Angle – 40 deg with S/B ratio ~ 1/6.

  ==> **Statistics will permit us to extract dN/dy around mid-rapidity.**
- Need to check for more runs ==> more statistics.
- Need to apply appropriate calibrations:

  - What are the necessary calibrations and how can we apply those to this analysis?
- Event mixing and normalization need to be studied systematically.
- Calculate acceptance, centrality dependent and run-by-run correction factors.