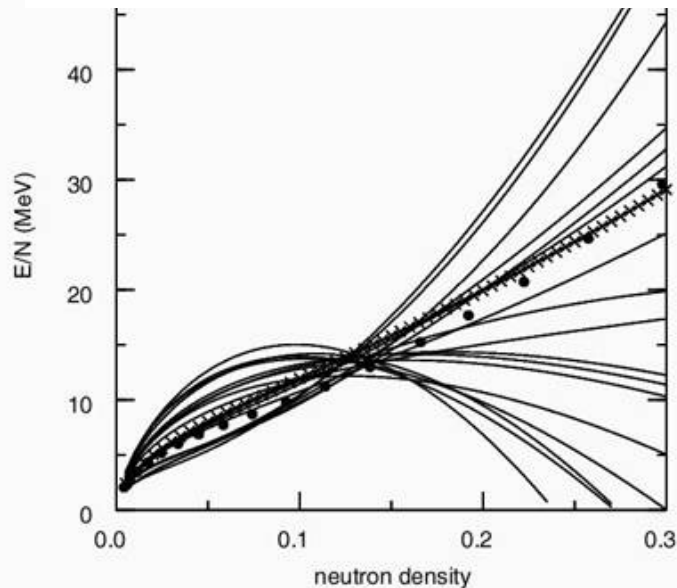


Differential neutron-proton squeeze-out

W. Trautmann, GSI Darmstadt

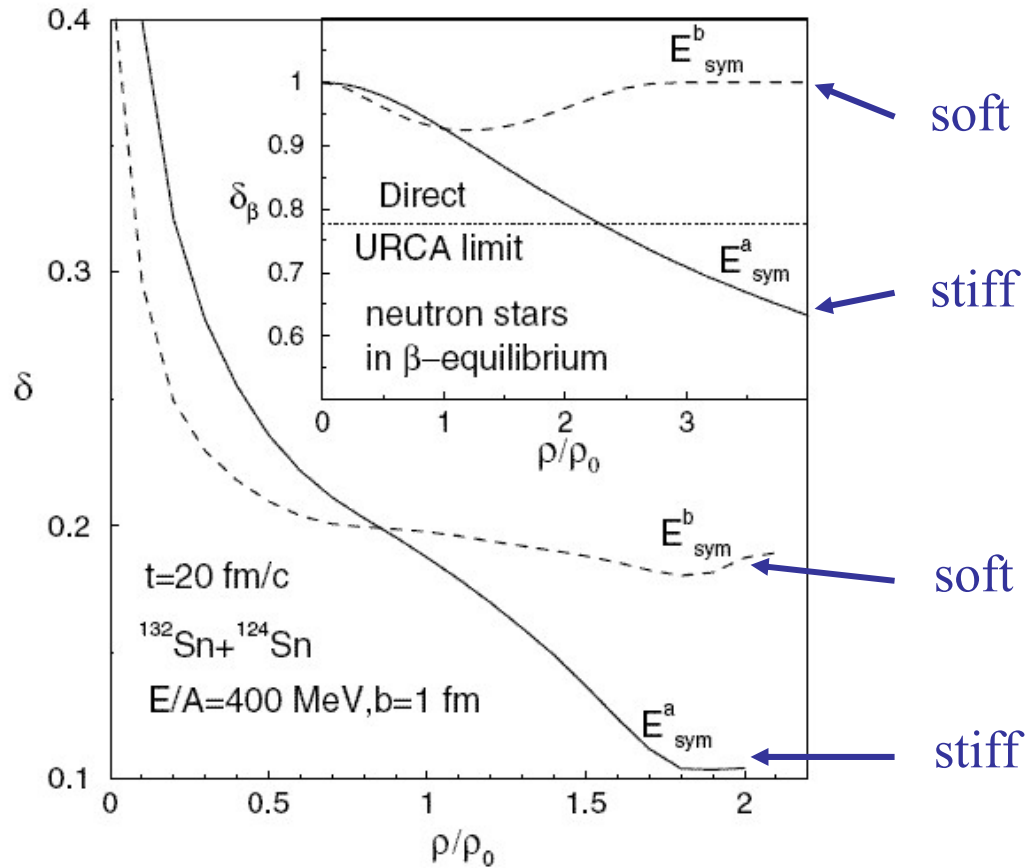
B.A. Brown, PRL 85 (2000)



18 Skyrme forces which fit the ^{132}Sn - ^{100}Sn mass difference; FP (dots) is variational with v14 potential (1981)

the symmetry energy at high density ??

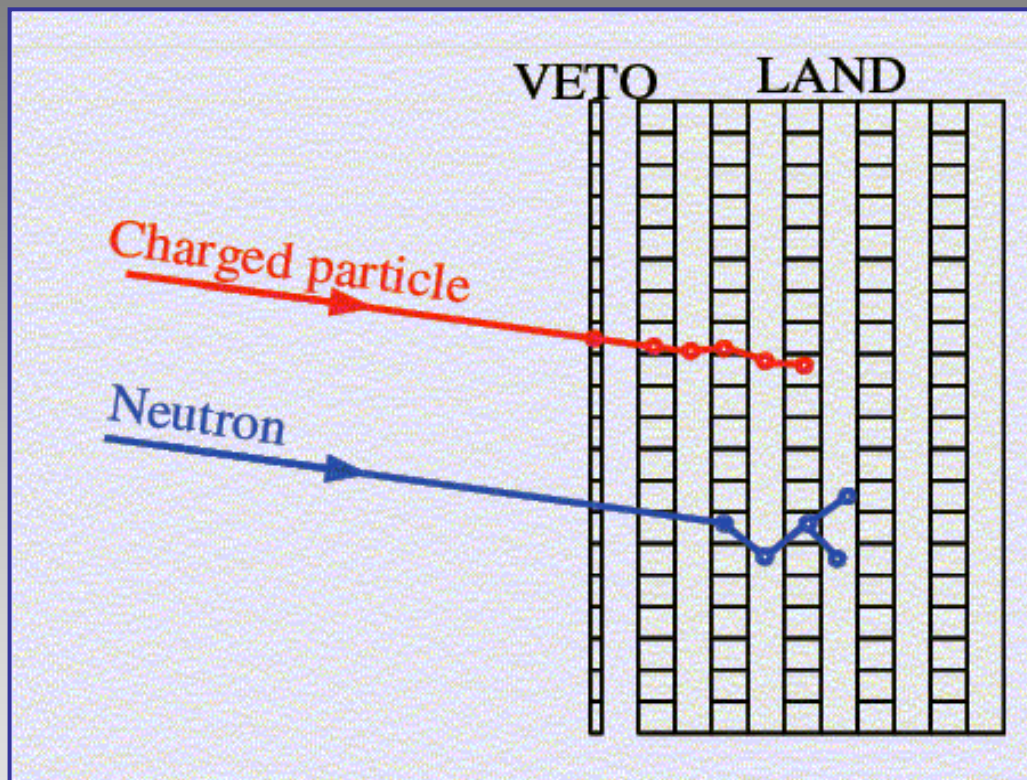
probes of high-density stage ?



differential
neutron-proton
flow

Bao-An Li, PRL 88, 192701 (2002)

can LAND be used to measure differential neutron/proton flow ?



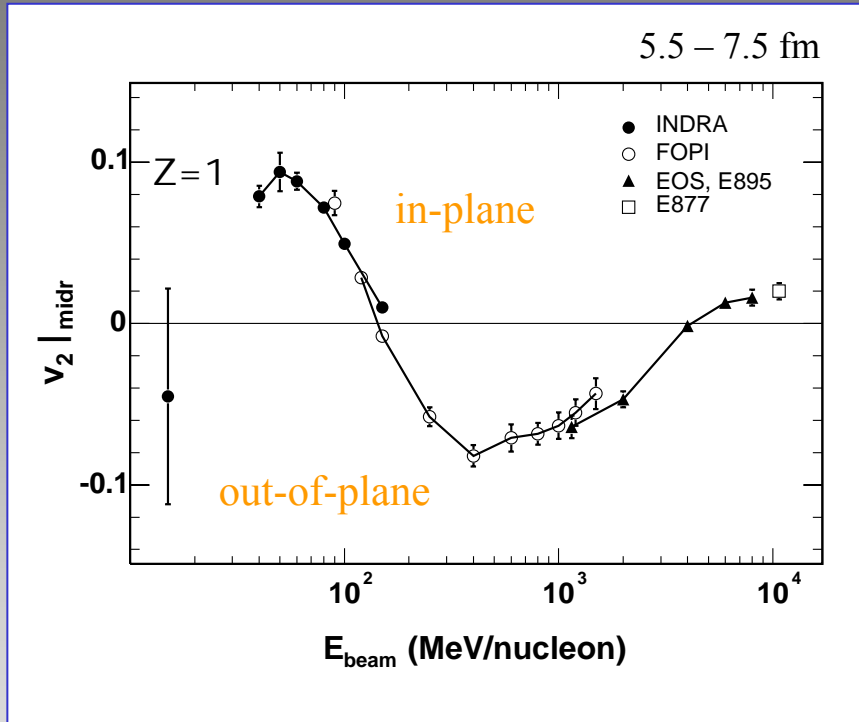
S254 analysis
by
J. Brzychczyk,
P. Pawlowski

neutron and proton detection

excitation functions of flow

new technique of correcting:
 J. Łukasik and W.T., Proc. IWM2005
 A. Andronic et al., EPJ A 30 (2006)

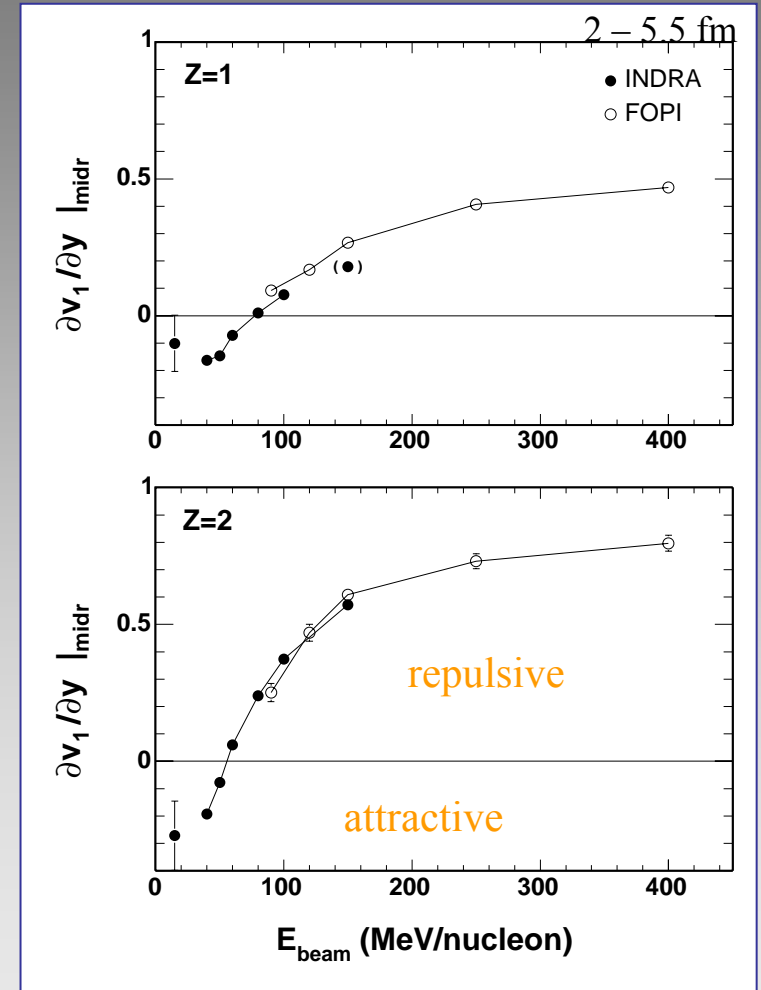
elliptic flow v_2



$v_1 \equiv \langle \cos(\phi - \phi_R) \rangle$	directed flow
$v_2 \equiv \langle \cos 2(\phi - \phi_R) \rangle$	elliptic flow

$^{197}\text{Au} + ^{197}\text{Au}$,
 data from INDRA, FOPI, AGS experiments

sideways flow dv_1/dy



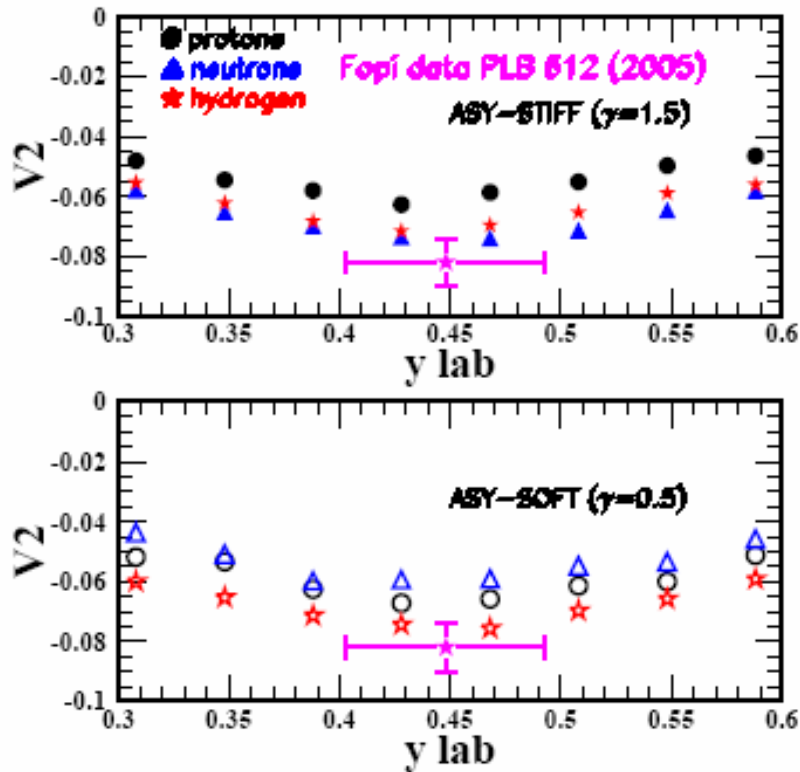
idea discussed at several occasions

FOPI days in Split 2005
LAND Collaboration Meeting 2006
CHIMERA-GSI workshop 2006
FOPI collaboration meeting 2007
Asy-EOS workshop in Catania 2008

Letter of Intent subm. Spring 2008
Proposal in preparation
for experiments at SIS and FAIR

differential elliptic flow

Q.F. Li and P. Russotto



UrQMD vs. FOPi data:
Au+Au @ 400 A MeV

stiff

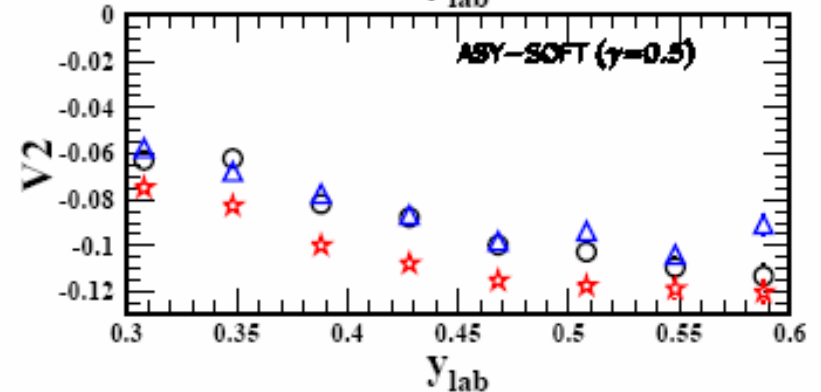
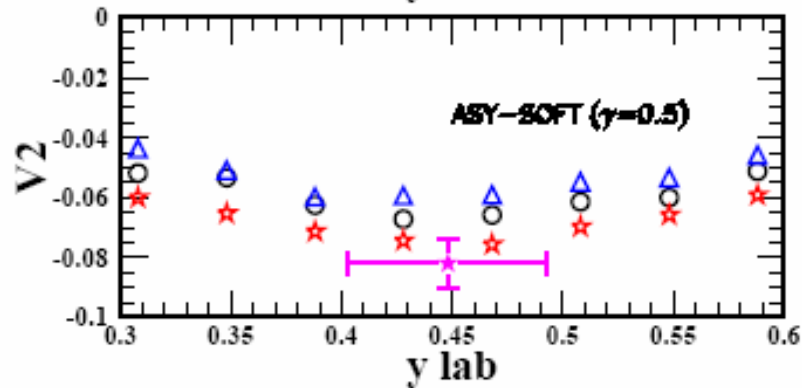
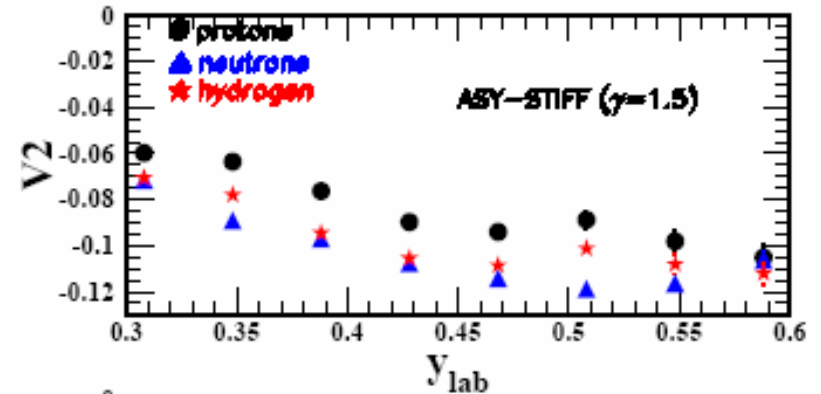
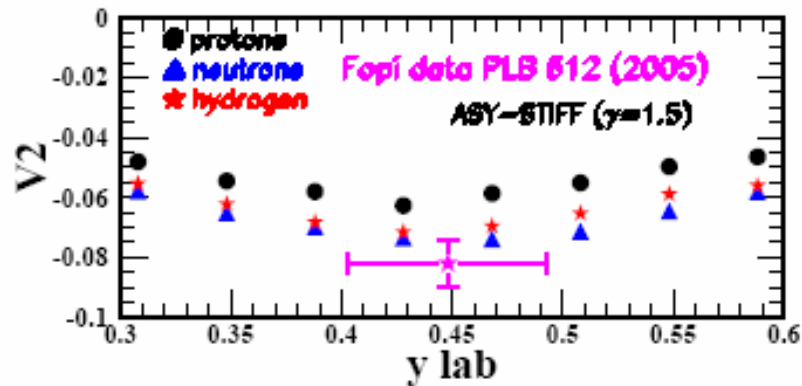
*inversion of neutron
and hydrogen flows*

soft

squeeze-out more
sensitive than the
directed flow

differential elliptic flow

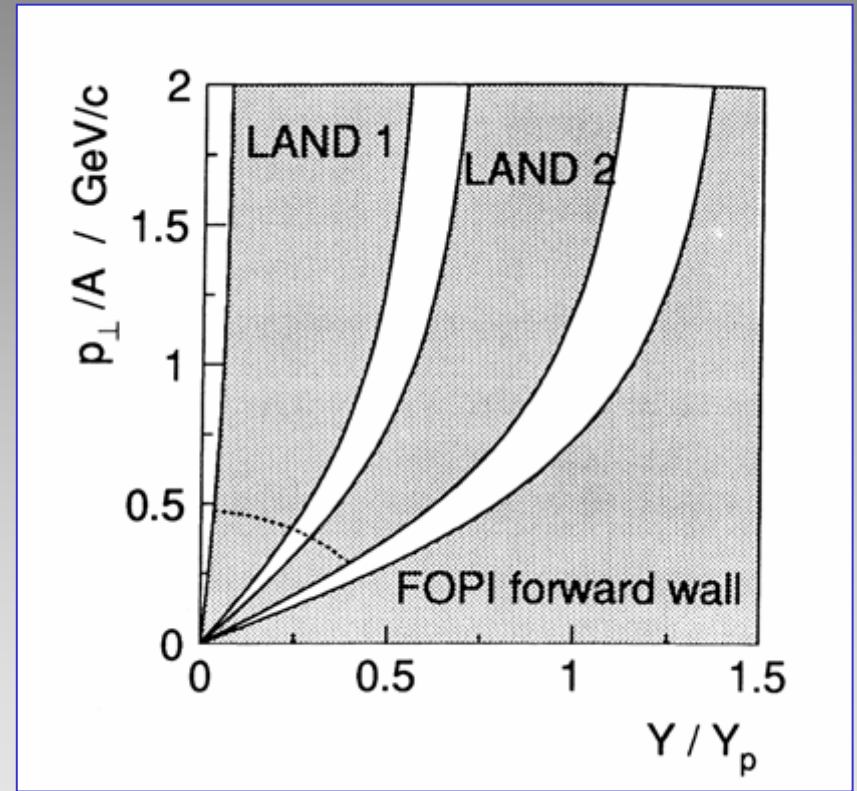
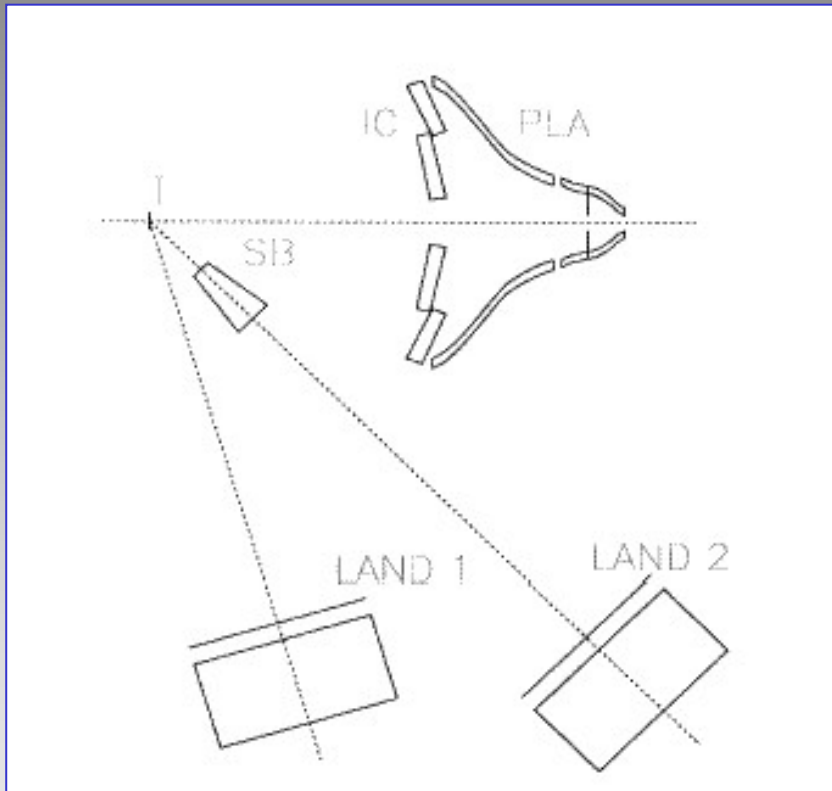
Q.F. Li and P. Russotto



inversion survives acceptance cuts of FOPI/LAND experiment

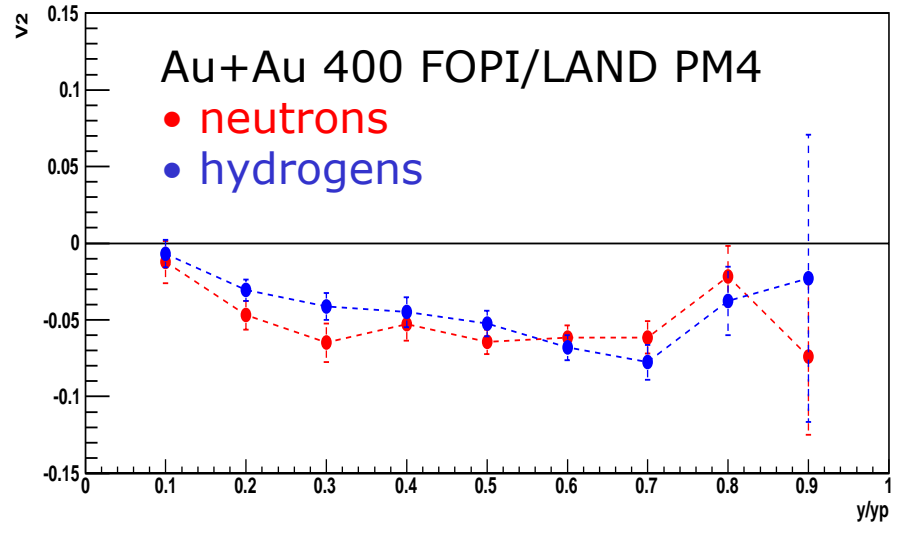
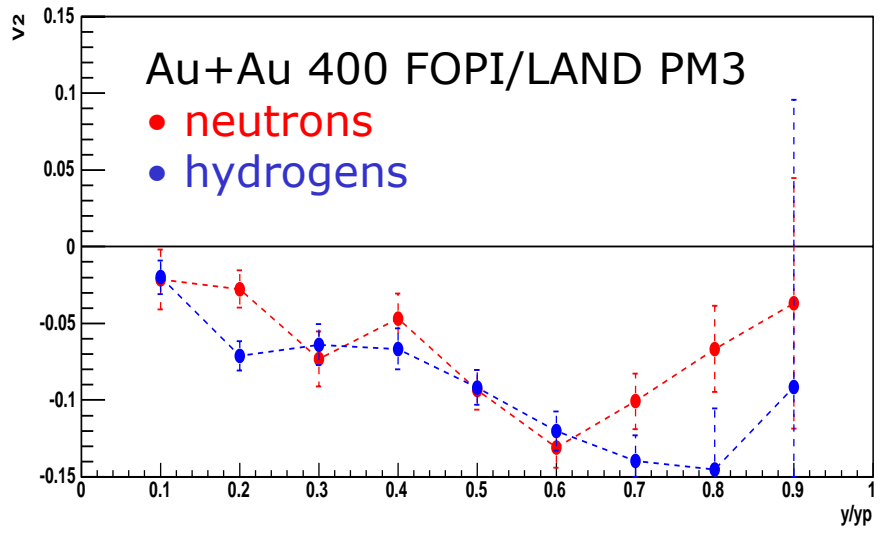
FOPI/LAND experiment on neutron squeeze out

Au+Au 400 A MeV



elliptic flow

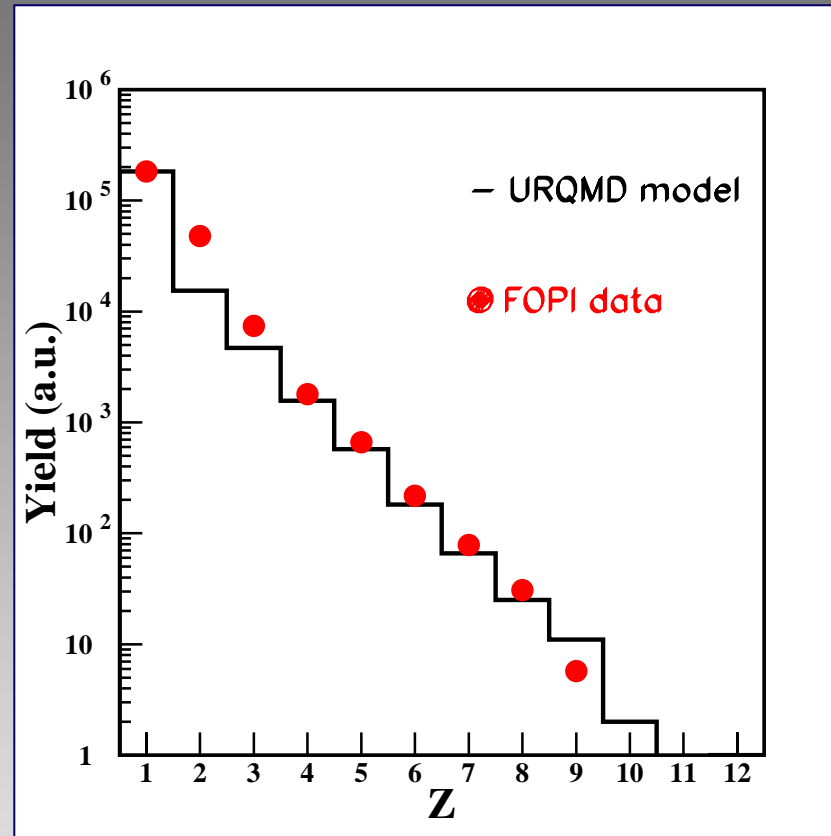
preliminary result
 $\gamma = 0.6 \pm 0.3$



the present limit is given by the statistics

test of cluster algorithm

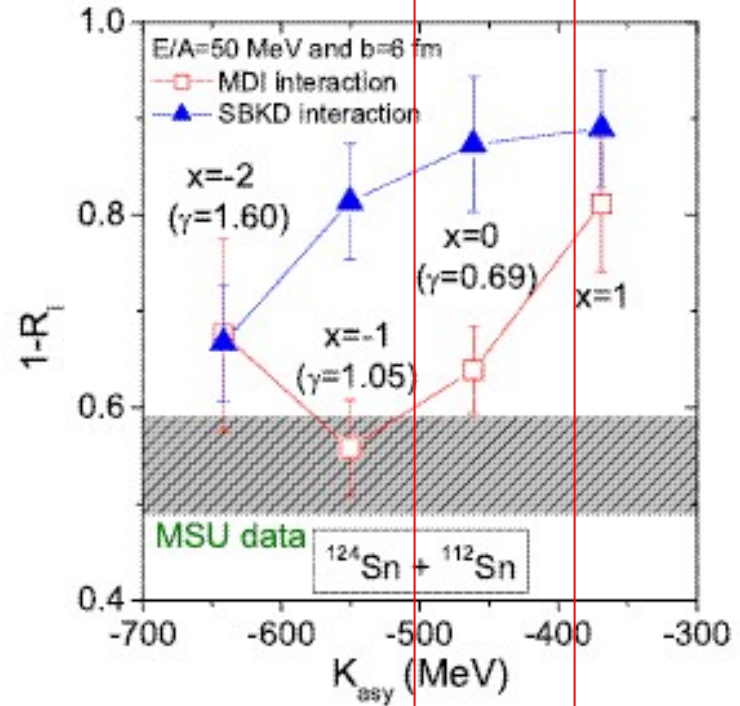
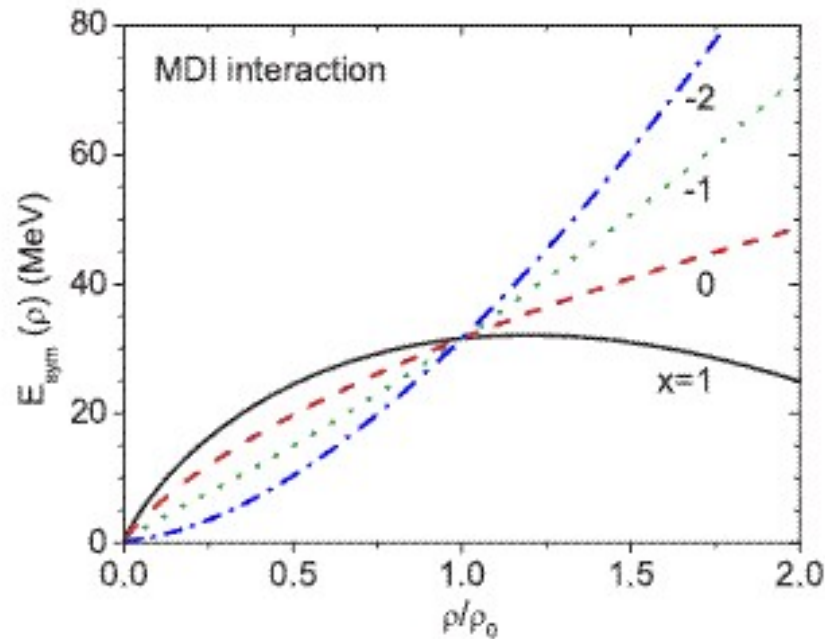
Q.F. Li and
P. Russotto



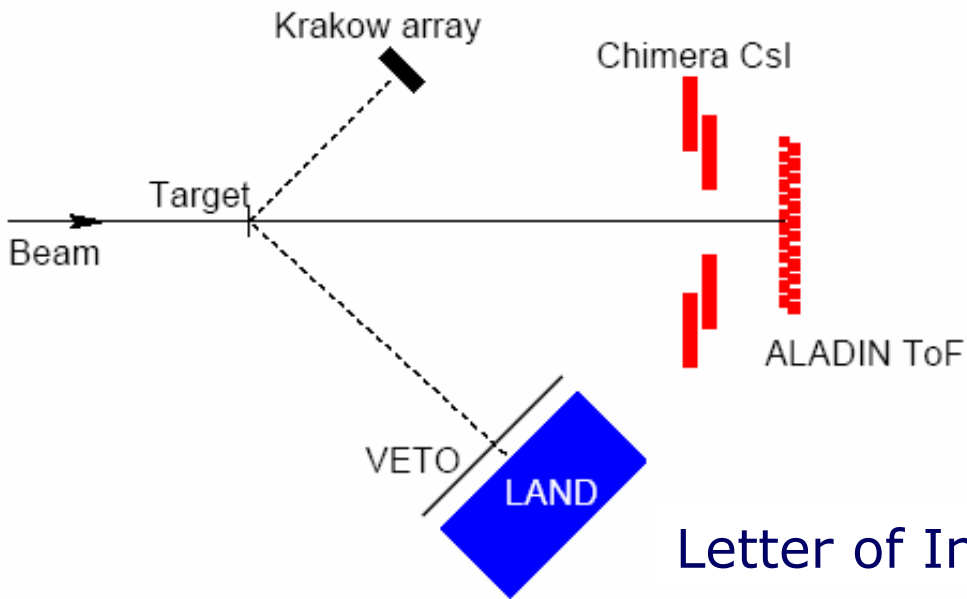
Z distribution (in arbitrary units) of charged particles in Au+Au at 400 AMeV central collisions (arbitrarily normalized at Z=1)

isospin diffusion

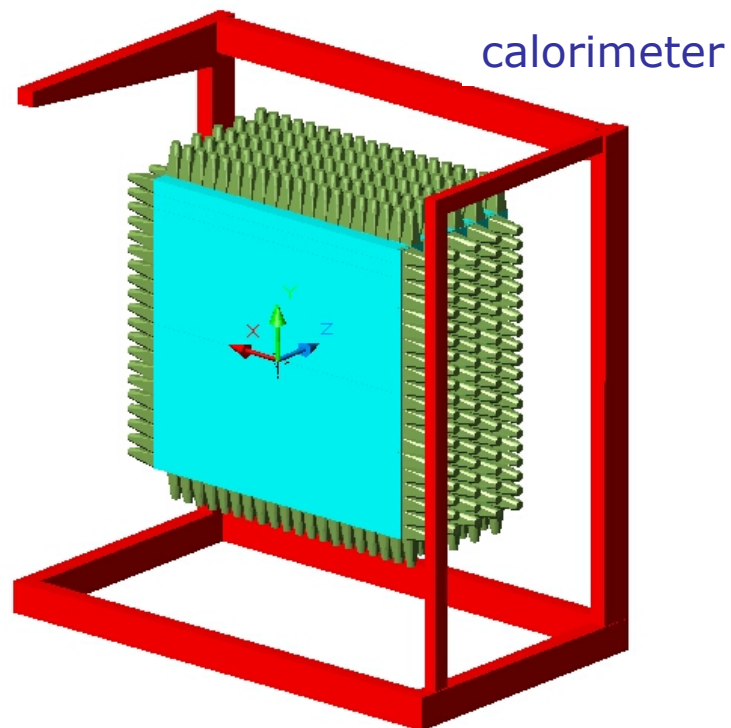
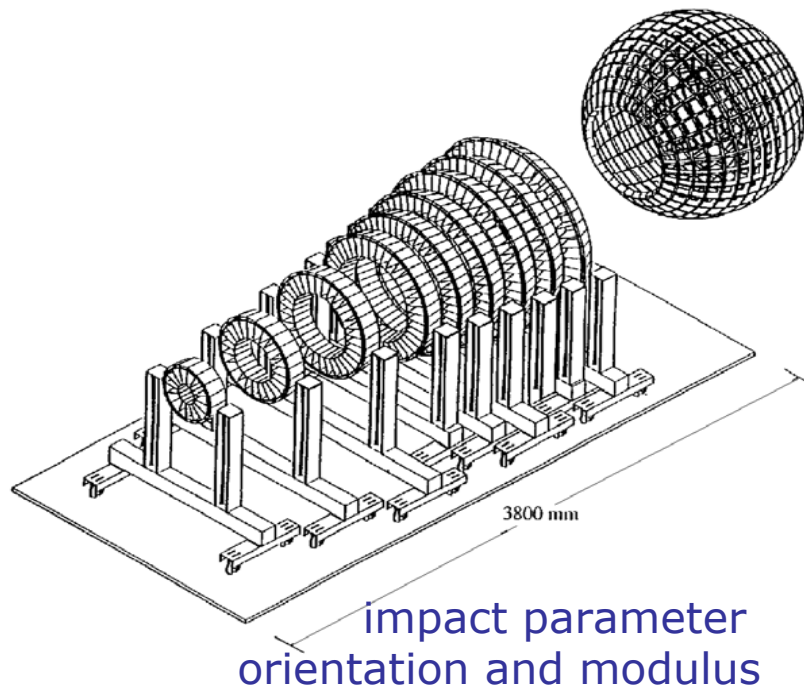
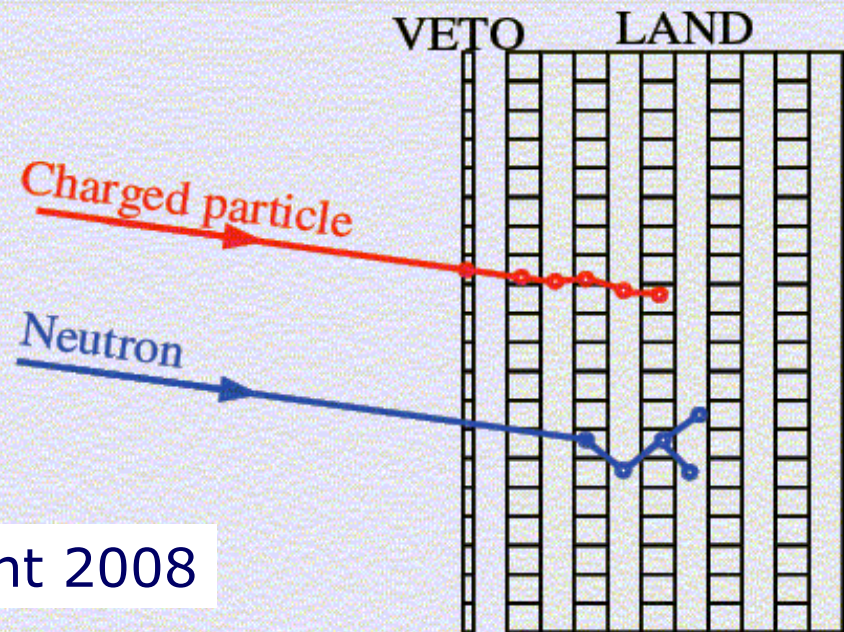
preliminary result
 $\gamma = 0.6 \pm 0.3$



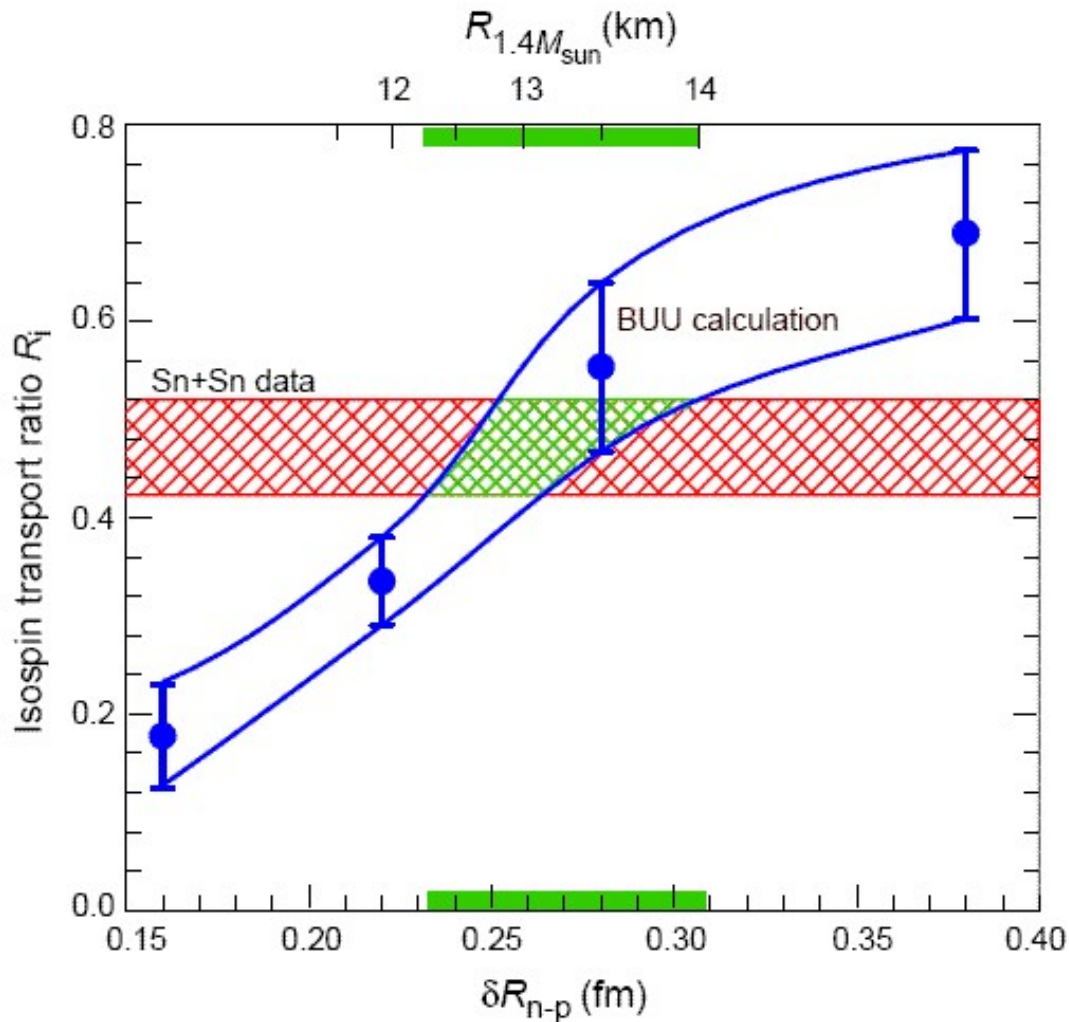
$$E_{\text{sym}}/A = a_4 + L/(\rho - \rho_0/\rho_0)/3 + K_{\text{asy}}(\rho - \rho_0/\rho_0)^2/18$$



Letter of Intent 2008



the goal: to achieve consistency for



from ISF
white paper
(MSU-NSCL)

neutron
stars
 3×10^{30} kg

heavy-ion
reactions

3×10^{-25} kg
neutron
skins

Letter of Intent 2008

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