

# Vorticity generation and transmission to polarisation in heavy-ion collision

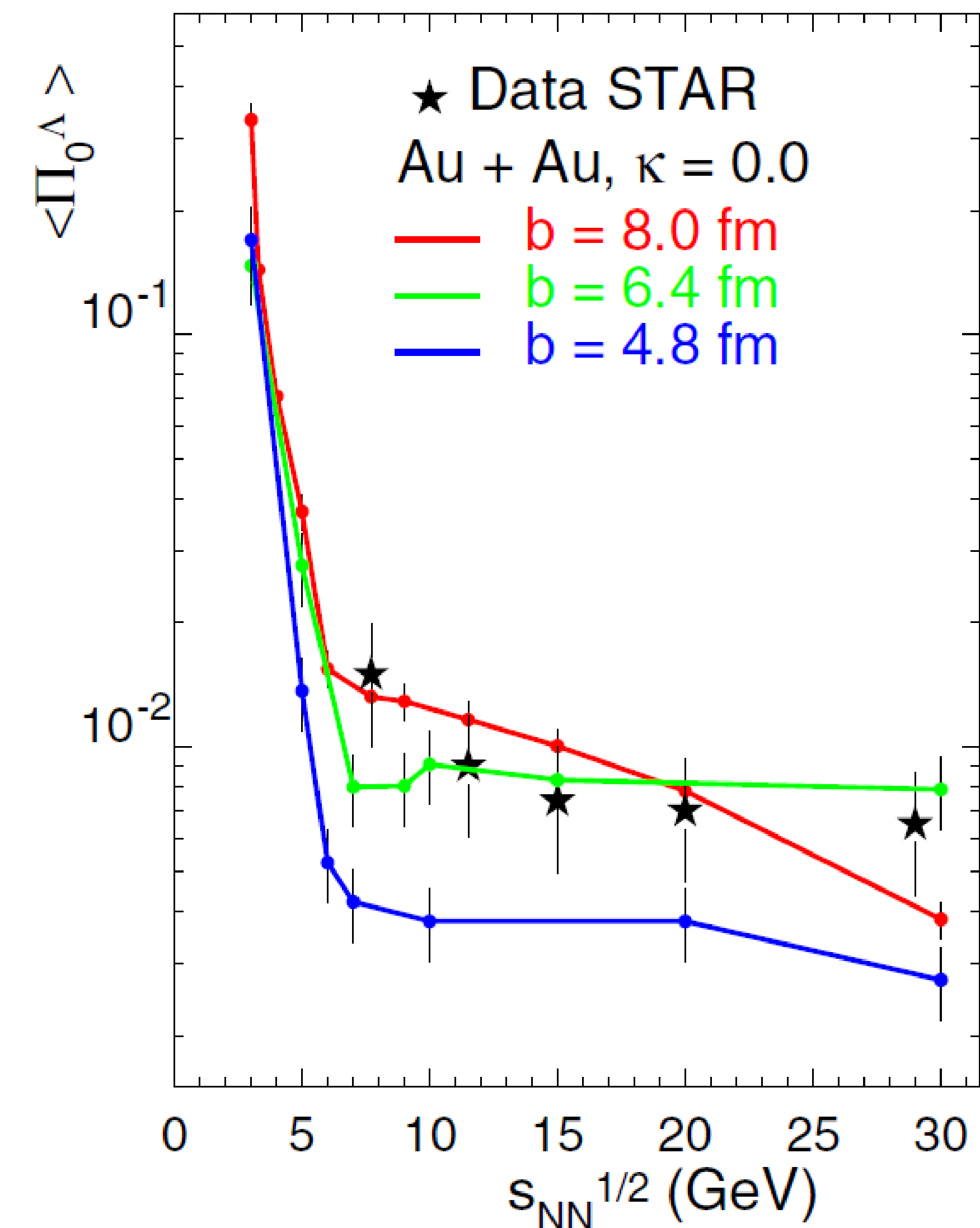
M. Baznat, K. Gudima, A. Sorin and O. Teryaev

Institute for Applied Physics, Chisinau, Moldova, Joint Institute for Nuclear Research, Dubna, Russia

## Abstract

We study the energy dependence of global polarization of  $\Lambda$  hyperons in peripheral Au-Au collisions. We combine the calculation of vorticity and strange chemical potential in the framework of the kinetic quark-gluon-string model with the anomalous mechanism related to the axial vortical effect. We pay special attention to the temperature-dependent contribution related to the holographic gravitational anomaly and find that the preliminary data from the BNL Relativistic Heavy Ion Collider are compatible with its suppression discovered earlier in lattice calculations.

## Impact parameter and energy dependence

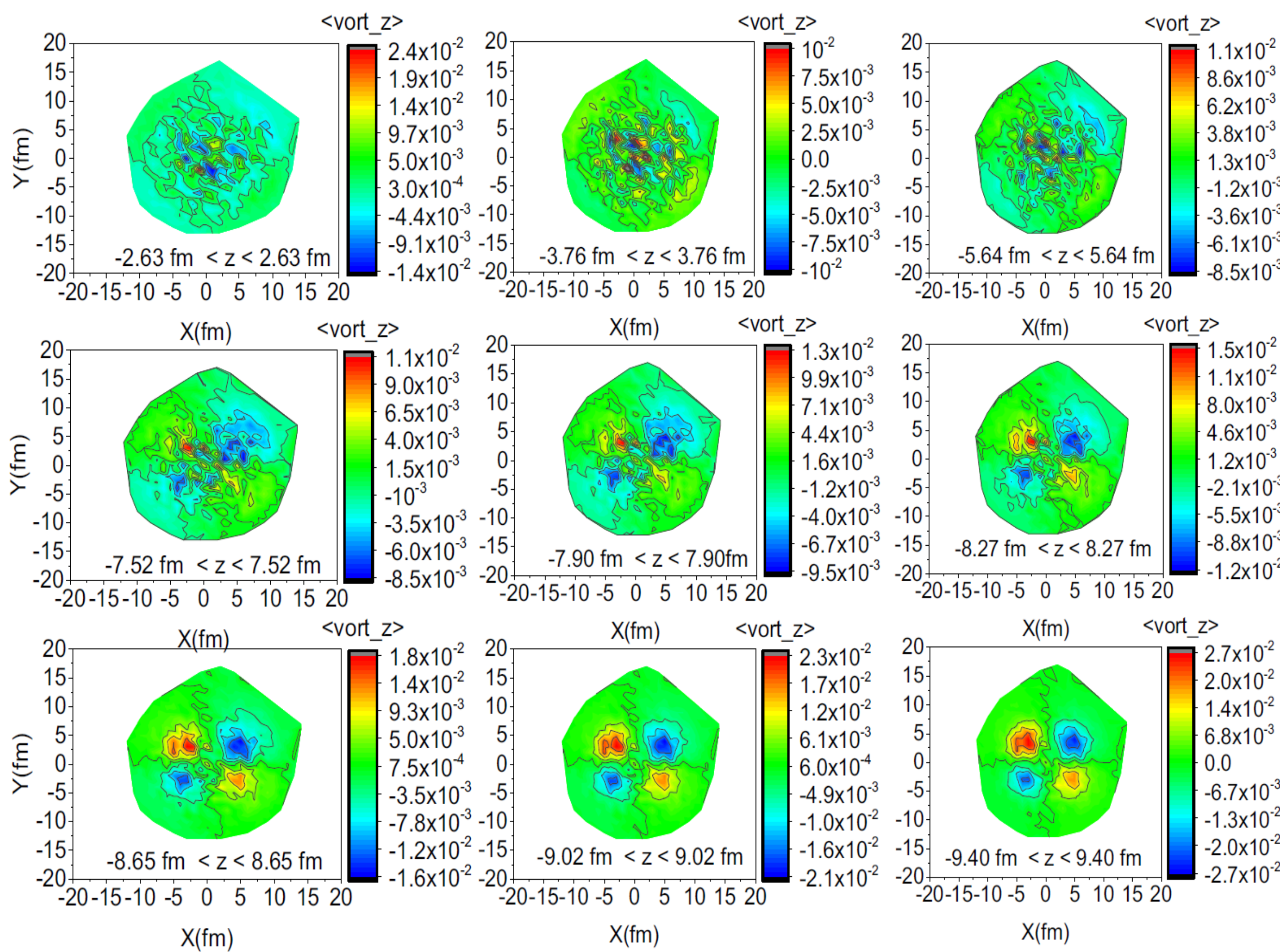


## Helicity separation and quadrupole structure of longitudinal vorticity

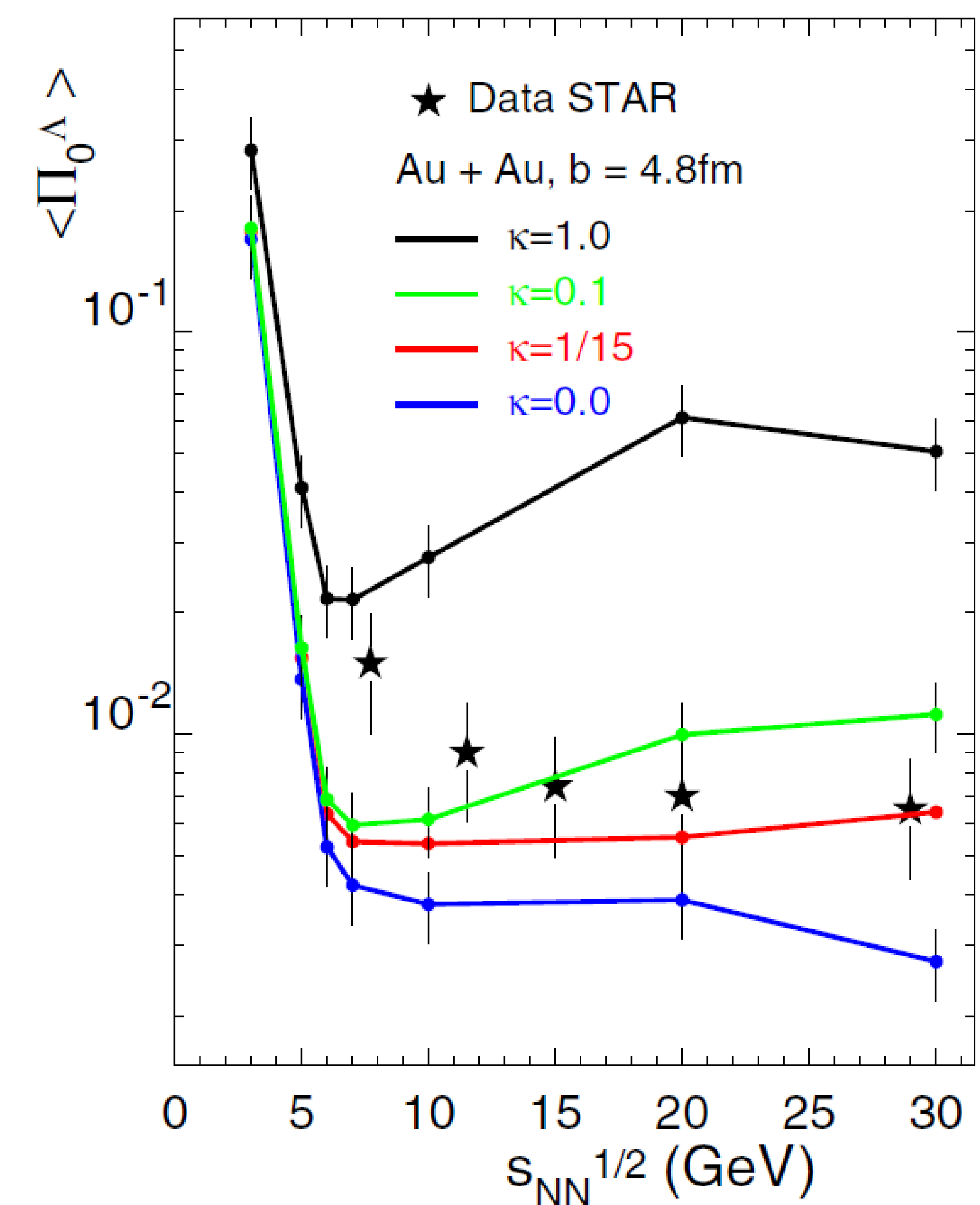
$$h = h_x + h_y + h_z \sim \text{sign}(y),$$

$$v_z \sim \text{sign}(x),$$

$$\omega_z \sim \text{sign}(x)\text{sign}(y),$$



## Dependence on the parameter k of holographic gravitational anomaly



## Gravitational holographic anomaly and lattice simulations (k parameter)

$$Q_5^s = N_c \int d^3x c_V \gamma^2 \epsilon^{ijk} v_i \partial_j v_k$$

$$c_V = \frac{\mu_s^2}{2\pi^2} + k \frac{T^2}{6}$$

$$\langle \Pi_y^\Lambda \rangle = \left\langle \frac{m_\Lambda}{N_\Lambda p_y} \right\rangle \frac{N_c}{2\pi^2} \int d^3x \mu_s^2(x) \gamma^2 \epsilon^{ijk} v_i \partial_j v_k.$$

## Polarisation for hyperons and anti-hyperons

