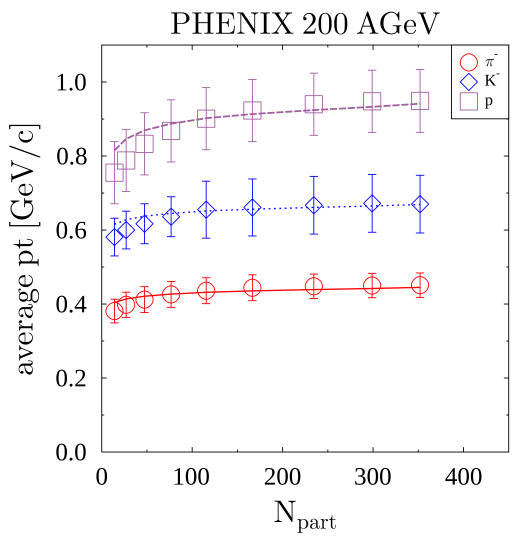

FIG. 3: $< p_T^i >$ as a function of the centrality for different particle species i. The PHENIX data [12] are presented by symbols, the calculations by lines.

	STAR				PHENIX	
	pp		$AA_{central}$		$AA_{central}$	
Particle	$\langle \mathbf{p_T} \rangle$	**Err.**	$\langle \mathbf{p_T} \rangle$	**Err.**	$\langle \mathbf{p_T} \rangle$	**Err.**
π^-	0.348	0.018	0.429	0.022	0.455	0.032
K^-	0.605	0.073	0.717	0.050	0.677	0.068
K_0	0.600	0.030	0.800	0.050		
p	0.686	0.041	1.104	0.11	0.949	0.085
$\bar{p}$	0.683	0.041	1.105	0.069	0.959	0.084
ϕ	0.820	0.050	0.970	0.097		
Λ	0.780	0.040	1.050	0.090		
$\bar{\Lambda}$	0.760	0.040				
Ξ	0.924	0.130	1.110	0.090		
$\bar{\Xi}$	0.881	0.130				
$\Omega + \bar{\Omega}$	1.080	0.300	1.260	0.090		

TABLE I: A summary of mid-rapidity $\langle \mathbf{p_T} \rangle$ in GeV/c for identified particles from the STAR [7–11] and the PHENIX [12] collaboration.

f^i_{core} by f_{core} in eq. 2 changes the curve only slightly. Its form is dominated by the difference between $< p_T >_{core}$ and $< p_T >_{corona}$. Tab.I summarizes the experimental $< p_T^i >_{\mathrm{corona}}$ and $< p_T^i >_{\mathrm{core}}$ which enter our calculations and which are taken from pp and central heavy ion collisions. PHENIX has measured very peripheral heavy ion collisions. The $< p_T >$ value there coincide within the error bars with the STAR pp data. We note that $< p_T^i >_{\mathrm{corona}} \; / < p_T^i >_{\mathrm{core}}$ varies from .81 for pions to .62 for protons.

By construction the core - corona model correlates the $< p_T^i >$ values of peripheral heavy ion reactions with those observed in pp. This correlation is shown in fig.4. It displays $< p_T^i >_{peri} \; / \; < p_T^i >_{core}$ as a function of $< p_T^i >_{corona} \; / \; < p_T^i >_{core}$, using eq.2, for different hadron species. The experiential data show this correlation as well, it is even stronger there. Thus also in experiment the value of $< p_T^i >$ in peripheral reactions is small as compared to that in central collisions for those hadrons for which $< p_T^i >$ measured in pp is small as compared to $< p_T^i >$ measured in central heavy ion collisions. This correlation is far from being trivial. If, as often assumed, the heavy ion collision can be described by hydrodynamical calculations we do not expect any correlation between peripheral heavy ion data and pp data. Therefore the correlations observed in fig. 4 support the validity of the core - corona approach and questions whether hydrodynamical calculations are the proper tool to describe non-central heavy ion reactions.

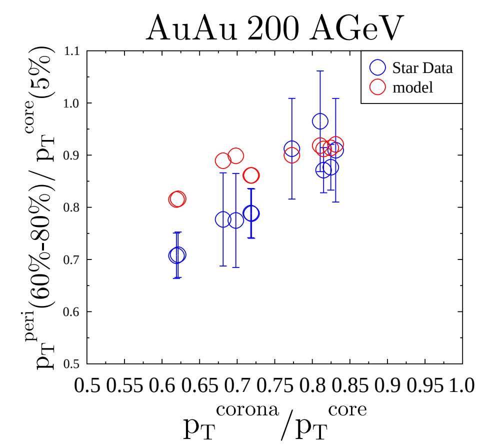

FIG. 4: The ratio of $< p_T >$ in peripheral to central reactions as compared to that of pp to central reactions. The data are from [7–11, 13]. Because the calculation uses the experimental data, the error bars of model predictions are of about the same size as that of the experimental points.

Corona particles do not form a thermal equilibrium with the core particles but decay like pp collisions and hence isotropically. Only the core particles feel the eccentricity of the overlap region. Because $M_{core}^{charged\ particles} \approx M_{corona}^{charged\ particles}$, v_2/ϵ_{part} is expected to be $\propto f_{core}$ and therefore the expected centrality dependence of v_2/ϵ_{part} is that of f_{core}. This allows for some immediate predictions. Because f_{core} is similar in central CuCu and