PHY397K - NUCLEAR PHYSICS - 4

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Spring 2015, Unique numbers: 57115
RLM 5.116, TTH 12:30 - 2:00 pm

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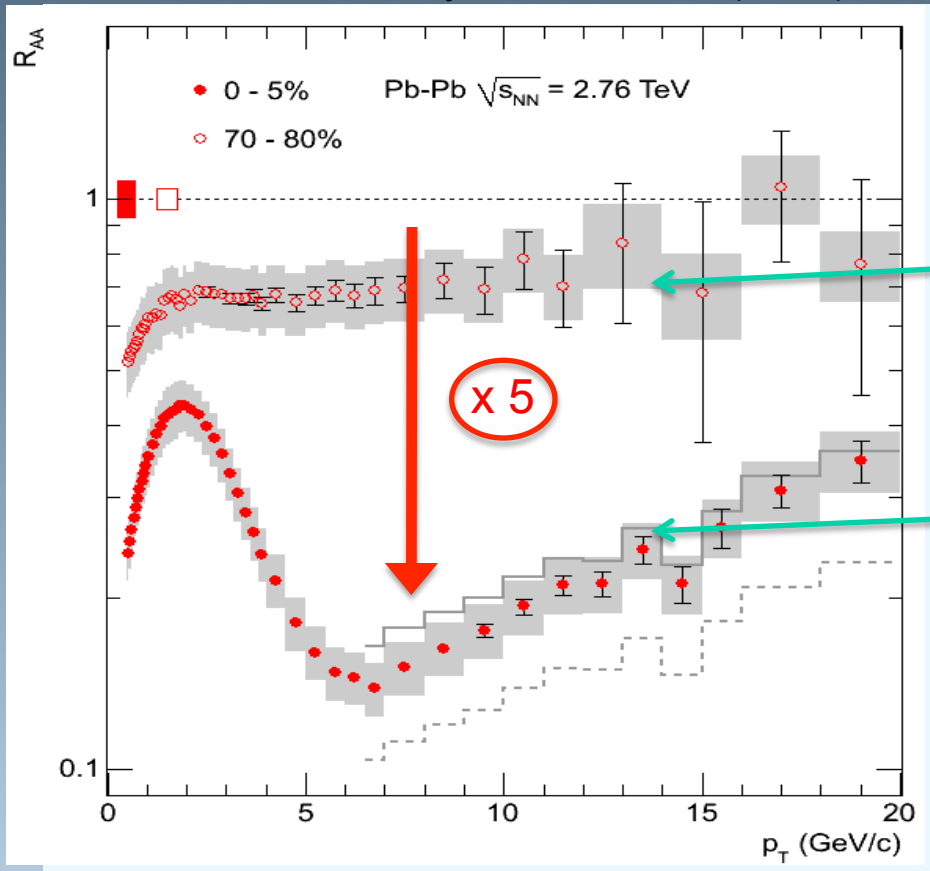
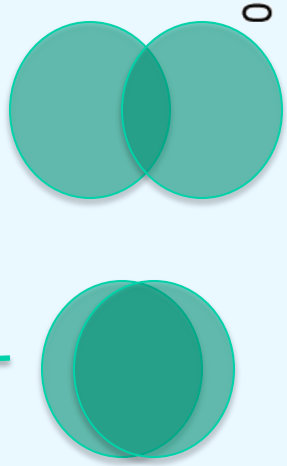
High transverse momentum suppression

ALICE: Phys. Lett. B 696 (2011) 30.



$$R_{AA} = \frac{d^2N/dp_T d\eta \ \text{(Pb+Pb)}}{T_{AA}\, d^2\sigma/dp_T d\eta \ \text{(p+p)}}$$



At high transverse momentum (p_T) the yield is only 1/5 of what we would expect from superposition p-p collision

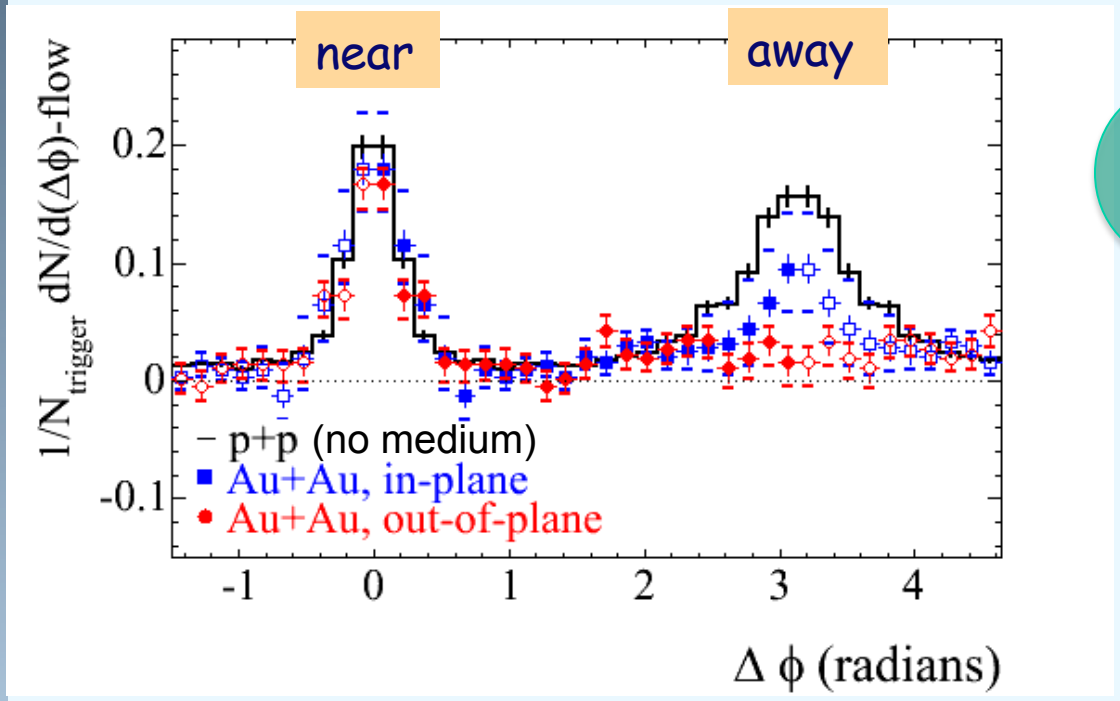
High p_T suppression → partonic medium (Jet modified by medium)

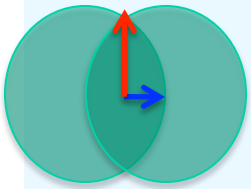
$\varepsilon \approx 15$ GeV/fm^3

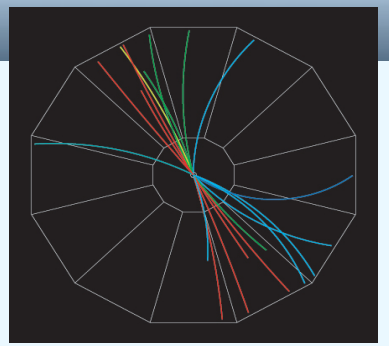
(e.g. X.N. Wang nucl-th/0307036)

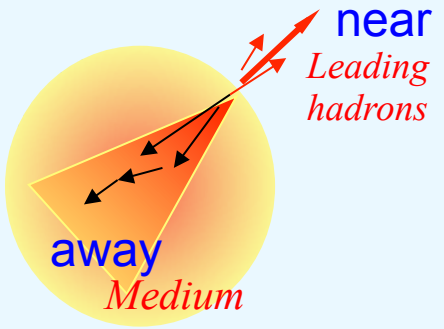
Di-jet quenching - energy loss in medium

Trigger particle p_T = 4-6 GeV
Correlated particle p_T = 2-4 GeV









Away-side suppression: (RHIC energies)
Suppression larger in out-of-plane
→ Path length dependence of energy loss
→ Density ≈ 15 GeV/fm3