Jet-medium interactions through vortex ring formation inside the QGP

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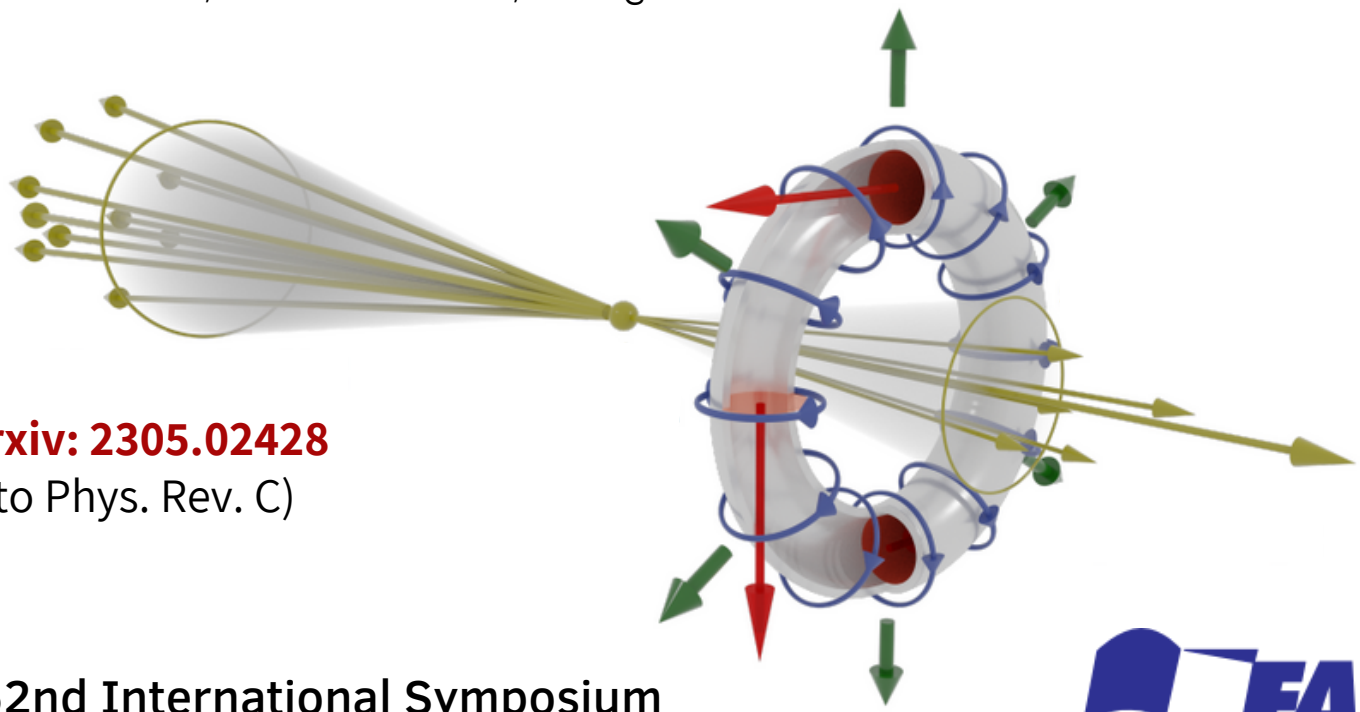

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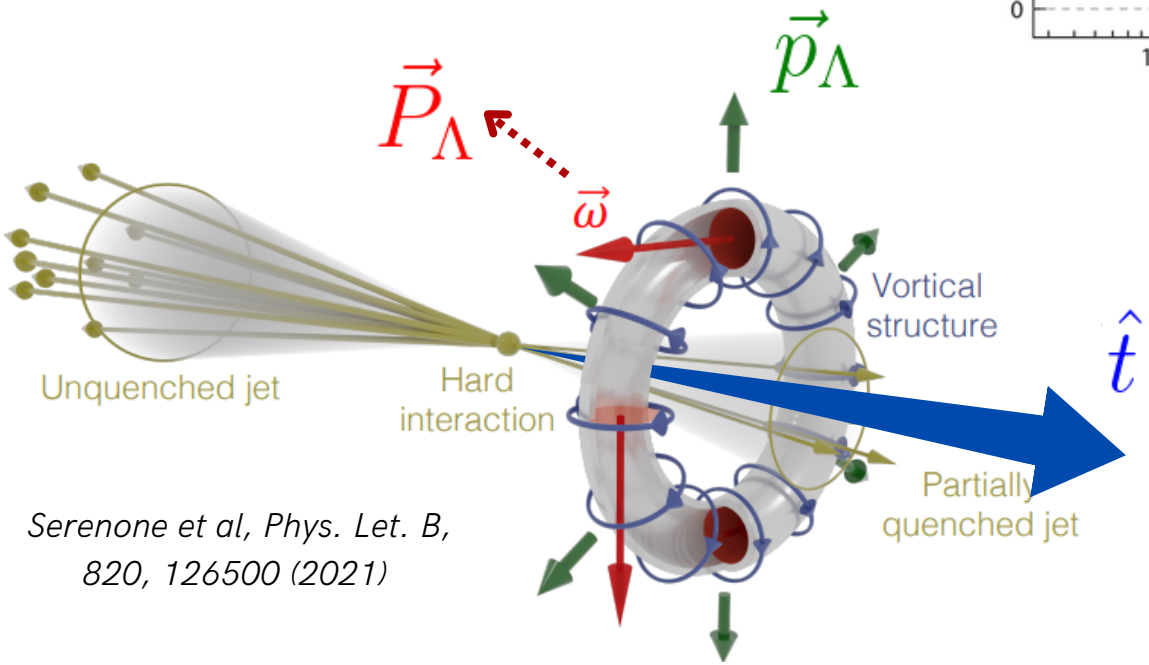
Jets as a source of vorticity

Jet Quenching

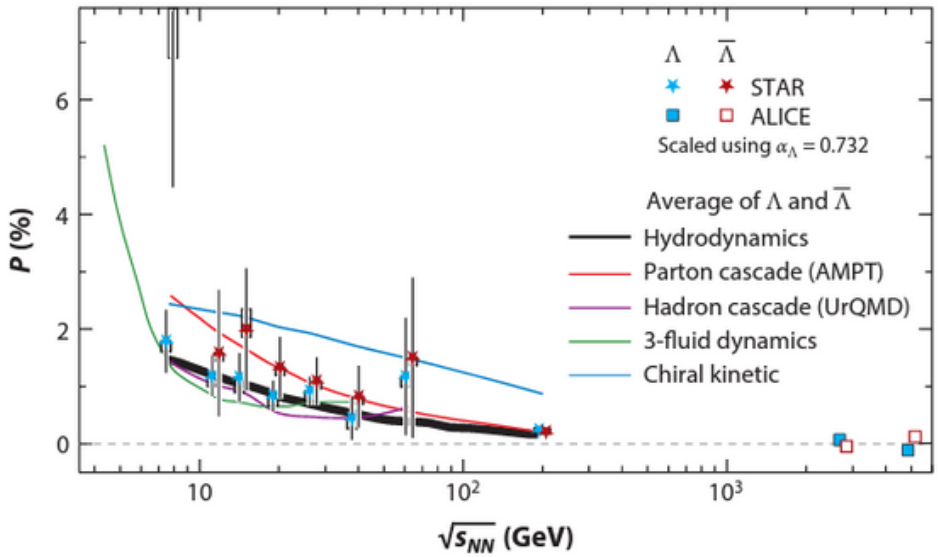
- Jet Energy Loss
- Fluid behavior

The energy absorbed from the jet thermalizes and behaves as a fluid!



Serenone et al, Phys. Let. B, 820, 126500 (2021)

Vorticity driven polarizaztion



Annu. Rev. Nucl. Part. Sci. 2020.70:395-423

Ring Observable

- isolate the circular **pattern of the ring effects.**

$$\mathcal{R}^t_\Lambda = \left\langle \frac{\vec{P}_\Lambda \cdot (\hat{t} \times \vec{p}_\Lambda)}{|\hat{t} \times \vec{p}_\Lambda|} \right\rangle$$

Jets as a source of vorticity

Jet Quenching

- Jet Energy Loss
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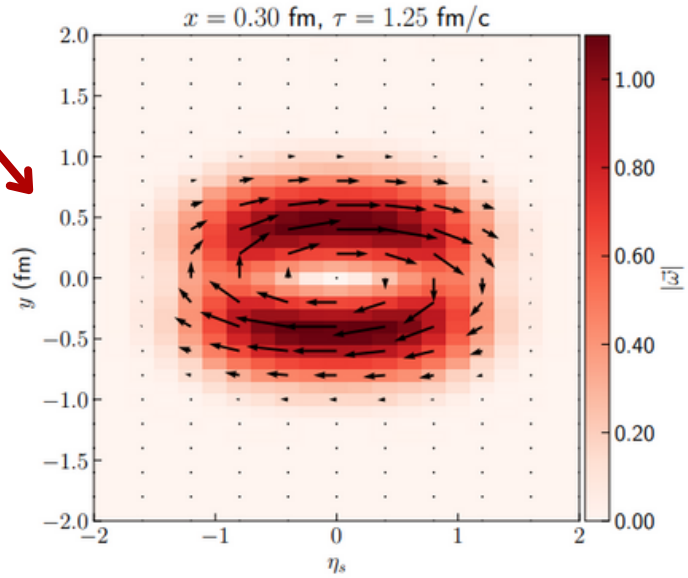
Scenario of vorticity ring formation already evaluated in **PLB, 820, 126500 (2021)**



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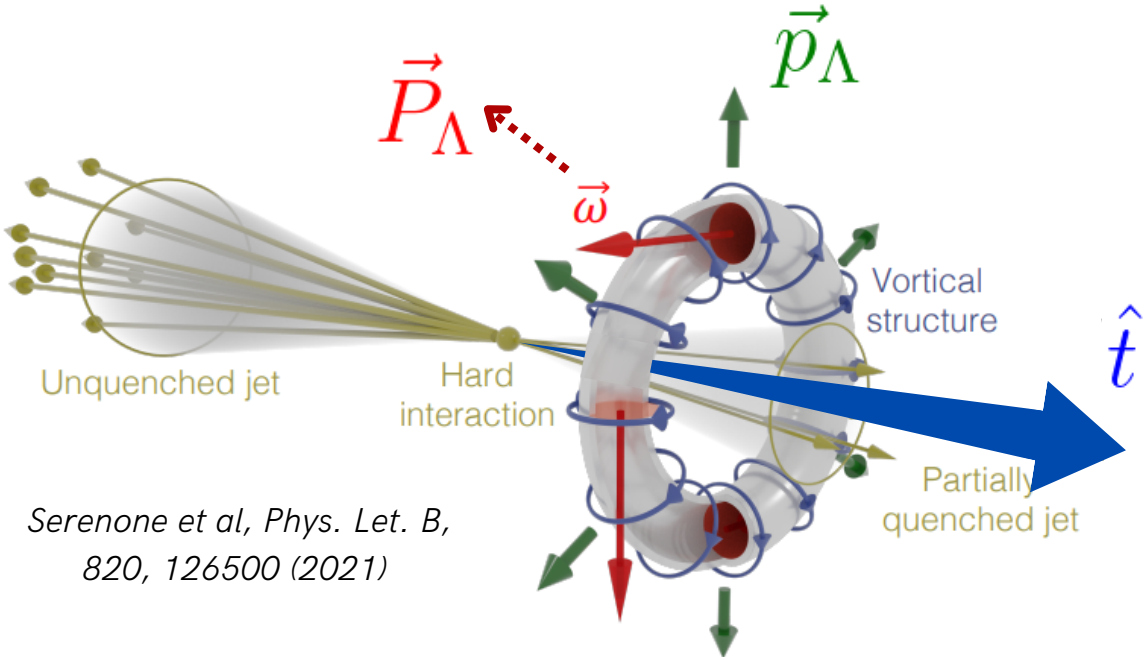

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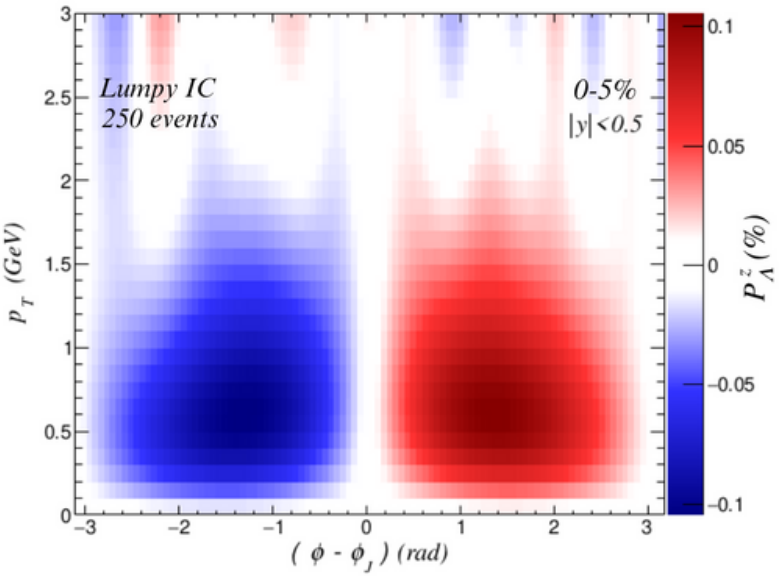
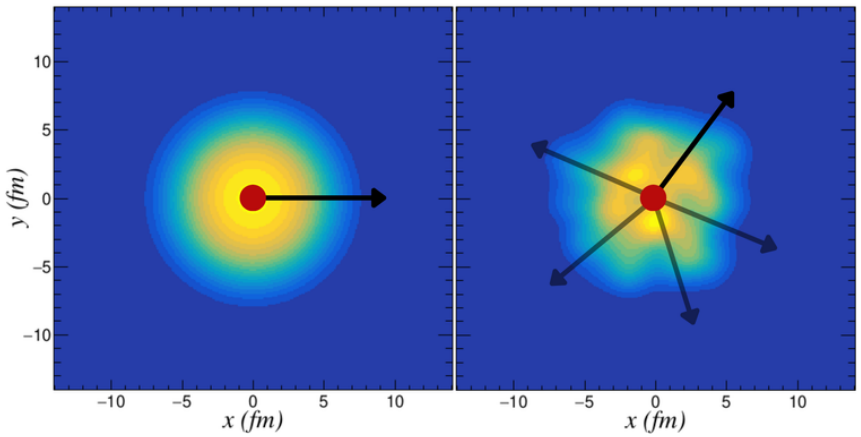


Systematic Study

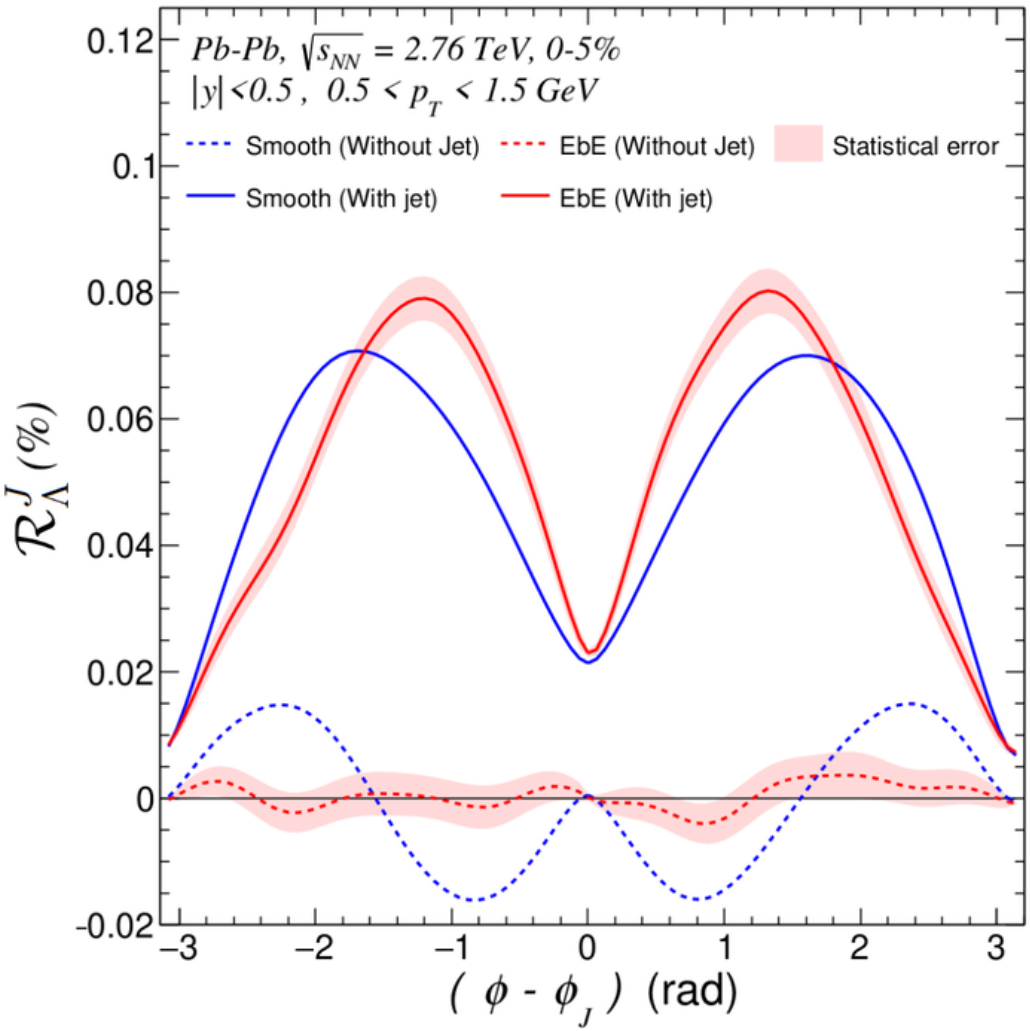
Smooth IC vs. Lumpy IC

(1 event) (250 events)



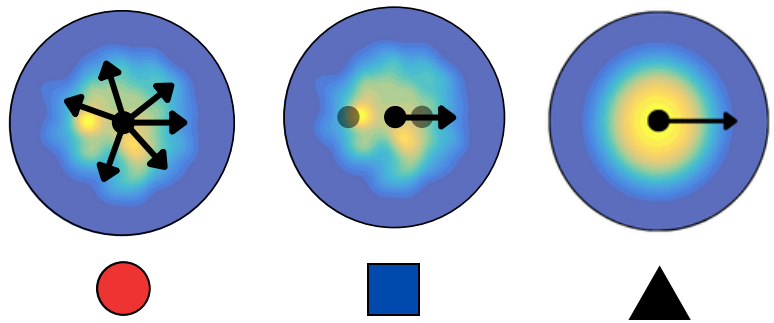
Jet pointing $+\hat{x}$

Randomization of jet direction



- The randomization of the jet's direction **suppresses the influence of background polarization.**
- Both analyses are **qualitatively similar** and present the same order of magnitude.

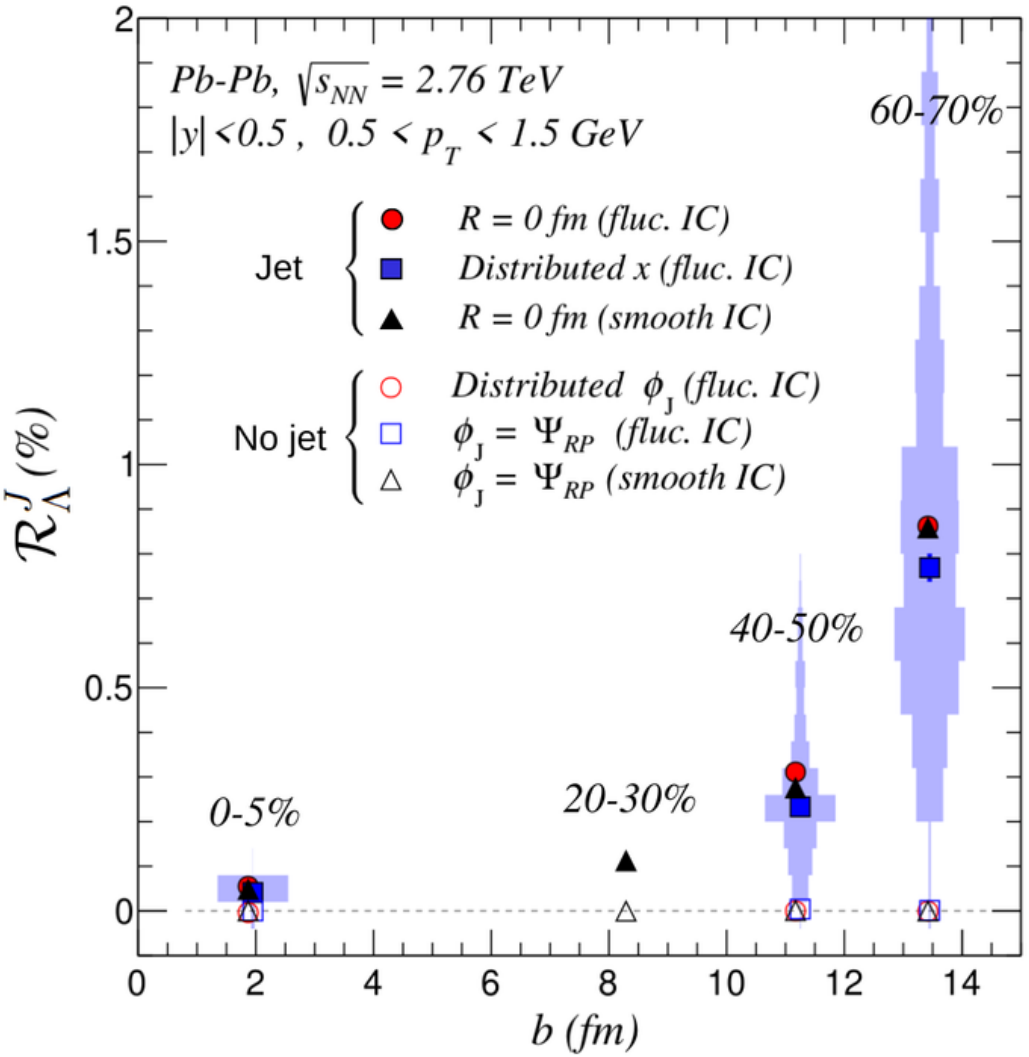
Systematic Study



Ebe distribution of distributed x

- Signal consistent with **zero** in **events without jet quenching;**
- **Jet-medium excitations induce non-zero measurements;**

- The ring observable is **robust** with different types of scenarios.



Thanks for your attention!