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Understanding the path length dependence of jet quenching in Heavy Ion Collisions from RHIC to LHC

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\begin{document}
% do not change the conference title
\noindent{\underline{The 12th International Conference on Nucleus-Nucleus Collisions, June 21-26, 2015, Catania, Italy}}

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\begin{center}
% insert the title of your abstract here
%{\large \bf Study of R_{AA} as function of Path-length with Flow harmonics and Glauber simulation in AA collisions}
{\large \bf Understanding the path length dependence of jet quenching in Heavy Ion Collisions from RHIC to LHC}
\end{center}

\begin{center}
% insert the authors here. The presenter is underlined
\underline{Myunggeun Song}[1], D.J~Kim[2]
\end{center}

\begin{center}
% these are the corresponding institutions
{\em [1] Yonsei University, South Korea} \\
{\em [2] University of Jyv\"{a}skyl\"{a}, Finland}\\
\end{center}

% write your abstract here
The centrality dependence of nuclear modification factor(R_{AA}) carries information about path-length depen-

dent partonic energy loss because mean path-length increases as the centrality increases. However, for a given centrality, inclusive R_{AA} emerges by averaging over different path-lengths which depend on the azimuthal angle w.r.t. the reaction plane assuming elliptical shape of overlapping zone of two colliding nuclei in the transverse plane. In this sense, azimuthal dependence of R_{AA} w.r.t. reaction plane offers to get a tighter constraint on the actual path length traversed by the parton in medium. As the azimuthal angle can be converted into the path-length with Glauber simulation[1] of two colliding nuclei, R_{AA} can be represented as a function of not only p_T, but also path-length. By utilizing the existing data from RHIC to LHC[2][3][4], we will show that R_{AA} seems to be aligned with respect to path-length, regardless of centralities in high transverse momentum regions ($p_T > 5GeV/$c) both for RHIC and LHC, and scales like universal function of square of Path-length. These results permit a detailed examination of the influence of geometry in the collision region and of the interplay between collective flow and jet-quenching effects.
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[1] M. L. Miller, et al, Ann.Rev.Nucl.Part.Sci. 57:205-243 (2007) \\ \
[2] ALICE, K. Aamodt et al., Phys. Lett. B696, 30 (2011), 1012.1004.\\ \
[3] ALICE Collaboration, K. Aamodt et al., Phys. Rev. Lett. 105, 252301 (2010).\\ \
[4] CMS Collaboration, Phys. Rev. Lett.87.014902 (2012) \\ \

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