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Study of Jet Quenching with Z+jet Correlations in Pb-Pb and pp Collisions at $\sqrt{s_{NN}}=5.02$ TeV (Article) [\(Open Access\)](#)

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Abstract

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The production of jets in association with Z bosons, reconstructed via the $\mu+\mu-$ and $e+e-$ decay channels, is studied in pp and, for the first time, in Pb-Pb collisions. Both data samples were collected by the CMS experiment at the LHC, at a nucleon-nucleon center-of-mass energy of 5.02 TeV. The Pb-Pb collisions were analyzed in the 0%-30% centrality range. The back-to-back azimuthal alignment was studied in both pp and Pb-Pb collisions for Z bosons with transverse momentum $p_{TZ} > 60$ GeV/c and a recoiling jet with $p_{Tjet} > 30$ GeV/c. The p_T imbalance $x_{jZ} = p_{Tjet}/p_{TZ}$, as well as the average number of jet partners per Z, R_{jZ} , was studied in intervals of p_{TZ} . The R_{jZ} is found to be smaller in Pb-Pb than in pp collisions, which suggests that in Pb-Pb collisions a larger fraction of partons associated with the Z bosons fall below the 30 GeV/c p_{Tjet} threshold because they lose energy. © 2017 CERN. © 2017 CERN, for the CMS Collaboration. Published by the American Physical Society under the terms of the "https://creativecommons.org/licenses/by/4.0/" Creative Commons Attribution 4.0 International license. Further distribution of this work must maintain attribution to the author(s) and the published article's title, journal citation, and DOI.

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