

High Energy Physics - Experiment

Detailed L3 measurements of Bose-Einstein correlations and a region of anti-correlations in hadronic Z^0 decays at LEP

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(Submitted on 5 Feb 2010)

L3 preliminary data of two-particle Bose-Einstein correlations are reported for hadronic Z^0 decays in $e+e-$ annihilation at LEP. The invariant relative momentum Q is identified as the eigenvariable of the measured correlation function. Significant anti-correlations are observed in the Bose-Einstein correlation function in a broad region of 0.5 - 1.6 GeV with a minimum at Q close to 0.8 GeV. Absence of Bose-Einstein correlations is demonstrated in the region above $Q \geq 1.6$ GeV. The effective source size is found to decrease with increasing value of the transverse mass of the pair, similarly to hadron-hadron and heavy ion reactions. These features and our data are described well by the non-thermal tau-model, which is based on strong space-time momentum-correlations.

Comments: 5 pages, 1 figure, invited talk at the XXXIXth International Symposium on Multiparticle Dynamics, Gomel, Belarus, September 2009

Subjects: **High Energy Physics - Experiment (hep-ex)**

Cite as: [arXiv:1002.1303v1](https://arxiv.org/abs/1002.1303v1) [hep-ex]

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[v1] Fri, 5 Feb 2010 20:37:12 GMT (64kb)

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