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Measurements of Two-Particle Correlations in pp collisions

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We present results on two-particle angular correlations in proton-proton collisions over a broad range of pseudorapidity ($\Delta\eta$) and azimuthal angle ($\Delta\phi$). The data were collected with the CMS detector. A complex two-dimensional correlation structure in $\Delta\eta$ and $\Delta\phi$ is observed. In the context of an independent cluster model of short-range correlations, the cluster size and its decay width are extracted from the two-particle pseudorapidity correlation function and compared with previous measurements in proton-proton and proton-antiproton collisions, as well as PYTHIA predictions. The results at 0.9 TeV are in agreement with previous measurements. The new results at 2.36 and 7 TeV represent the highest-energy measurements at a particle collider to date. Furthermore, Bose-Einstein correlations have been measured using samples of proton-proton collisions at 0.9 and 2.36 TeV center-of-mass energy. The signal is observed in the form of an enhancement of pairs of same-sign charged particles with small relative four-momentum. A significant increase of the size of the correlated particle emission region with the particle multiplicity in the event is observed.

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