Multiplicity distribution of charged particles in $e^+ e^-$ annihilation in 54-57 GeV centre of mass energy and KNO scaling

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Abstract
In this paper, we investigate the multiplicity of charged particles in $e^+ e^-$ annihilation by using different models. To achieve this we first fit the multiplicity distribution of charged particles in the energy range of 54-57 GeV by using both the Poisson distribution and KNO scaling, then we compare these results with multiplicity distribution at the lower energies. This comparison shows that our results are more compatible with KNO scaling in this energy range. Also we fit the multiplicity distribution of our data, together with the other data up to 206 GeV, to Fermi model, the pp data model and the model obtained from perturbative QCD. The coefficients obtained by these methods are consistent with those obtained at lower energies.

Keywords: $e^+ e^-$ annihilations, multiplicity, KNO scaling, Fermi model

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