Low Mass Dileptons from Pb+Au Collisions at CERN SPS

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Abstract

We show that the dilepton spectra measured by the CERES collaboration in Pb + Au interactions for various charge multiplicities can be reproduced with hadronic initial state either by a large broadening or reduction in the masses of vector mesons. However, we note that although the photon spectra is affected by the decrease in vector meson masses it is insensitive to the spectral broadening. It is found that for higher multiplicities a good description of the data can also be obtained with quark gluon plasma initial state if the reduction of the vector meson masses in the mixed and hadronic phases are taken into account. We observe that a thermal source with initial temperature ~ 200 MeV can reproduce the observed enhancement in the low mass region of the dilepton spectra. It is not possible to state which one of the two initial states (QGP or hadronic) is compatible with the data. These findings are in agreement with our earlier results obtained from the analysis of the WA98 photon spectra. We estimate the number of $\pi - \pi$ collisions near the ρ-peak of the dilepton spectra and argue that thermal equilibrium may have been achieved in the system, justifying the use of hydrodynamical model to describe the space time evolution.

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