New Results on Intermediate Mass Dileptons

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The NA50 collaboration has measured dimuon production in the mass continuum between the ϕ and the J/ψ, in Pb–Pb interactions at 158 A GeV/c and in p–A interactions at 450 GeV/c at the CERN SPS.

An analysis of these data samples and of the NA38 S–U data (at 200 A GeV/c) has been done in order to establish if the absolute yield and the differential distributions in mass, rapidity and transverse momentum can be explained in terms of known sources, namely Drell–Yan and Open Charm.

The spectral shapes of the sources folded with the apparatus acceptance have been evaluated with PYTHIA. Particular care has been taken for the Combinatorial Background subtraction (muon pairs from π and K decays), based essentially on like sign dimuon data, plus input on charge correlations from the VENUS event generator.

A simultaneous fit to the NA50 p–Al, p–Cu, p–Ag and p–W data samples gives an Open Charm cross-section slightly higher, but compatible with published CERN and FNAL data on proton and pion induced reactions; this cross-section point is used to normalize PYTHIA calculations and therefore to establish the expected source level in A-B collisions.

We find that both Pb–Pb and S–U samples exhibit an excess of dimuons w.r.t. expected sources; this excess is compatible with an enhancement of the open charm component, and increases smoothly with the number of participants in the collision, reaching a factor $\sim$3 for central Pb-Pb collisions. A study of the p_T distributions supports the conclusion that we indeed see a charm-like enhancement in A–B collisions.