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Realistic cross sections for exclusive rho^0 rho^0 production in ultrarelativistic heavy-ion collisions.

Relativistic heavy-ion collisions at RHIC and LHC represent an intense source for photon induced processes. We present, calculated for the first time, realistic cross section for exclusive electromagnetic production of two neutral rho mesons in coherent photon-photon processes. We consider the process [A A $\longrightarrow$ A rho^0 rho^0 A] in Au-Au collisions at sqrt(s_{NN})=200 GeV and Pb-Pb collisions at sqrt(s_{NN})=5500 GeV. For low-energy part of the elementary [gamma gamma $\longrightarrow$ rho^0 rho^0] process, we use experimental data which were measured by several group at e^+ e^+ colliders, while for higher energy, we include a vector-dominance-model (VDM)-Regge contribution. The suggested model well describes the experimental data for W>~2.5 GeV. To illustrate the sensitivity of our calculations on details of the nuclear form factor, we also compare realistic charge density with monopole and point-like form factors. The cross section is calculated in the equivalent photon approximation. We consider peripheral collisions so the impact parameter of the beam particles is larger than the sum of their nuclear radii. Our estimates include the presence of the absorption effects. Finally, large cross section, of the order of fraction of milibarn, have been found. The bulk of the cross section is concentrated in low rho^0 rho^0 invariant masses.
The rho^0 mesons, decaying into pi^+ pi^-, could be measured by the STAR Collaboration at RHIC and ALICE Collaboration at LHC.

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