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On the pair correlations of neutral K , D , B and B_s mesons with close momenta produced in inclusive multiparticle processes

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The comparative theoretical analysis of pair correlations of two neutral K mesons and two neutral heavy mesons (D , B , B_s), generated in inclusive processes – hadron-hadron, hadron–nucleus and nucleus–nucleus collisions – with strangeness and charm (beauty) conservation, is performed. For K^0 mesons, relations describing the dependence of the correlations of two short-lived and two long-lived neutral kaons and the correlations of “mixed” pairs $K_S^0 K_L^0$ at small relative momenta upon the space-time parameters of the generation region of K^0 and \bar{K}^0 mesons have been obtained. It is shown that under the strangeness conservation the correlation functions of the pairs $K_S^0 K_S^0$ and $K_L^0 K_L^0$, produced in the same inclusive process, coincide, and the difference between the correlation functions of the pairs $K_S^0 K_S^0$ and $K_S^0 K_L^0$ is conditioned exclusively by the production of the pairs of non-identical neutral kaons $K^0 \bar{K}^0$.

For the case of D^0 , B^0 and B_s^0 mesons, correlations have the quite analogous character and they are described by quite similar expressions: in particular, just as for K^0 mesons, the correlation functions for the pairs of states with the same CP parity ($R_{SS} = R_{LL}$) and for the pairs of states with different CP parity (R_{SL}) do not coincide, and the difference between them is conditioned exclusively by the production of the pairs $D^0 \bar{D}^0$, $B^0 \bar{B}^0$, $B_s^0 \bar{B}_s^0$. However, contrary to the case of K^0 mesons, here the distinction of CP -even and CP -odd states encounters difficulties – due to the insignificant differences of their lifetimes and the relatively small

probability of purely CP -even and CP -odd decay channels, and one may hope that it will become possible at future colliders.

Primary author: Dr LYUBOSHITZ, Valery (Joint Institute for Nuclear Research (Dubna))

Co-author: Dr LYUBOSHITZ, Vladimir (Joint Institute for Nuclear Research, Dubna)

Presenter: Dr LYUBOSHITZ, Valery (Joint Institute for Nuclear Research (Dubna))

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