

THE ROLE OF SPIN IN QUARK HADRONIZATION

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The measurements of the single spin asymmetries in semi-inclusive one- and two- hadron production in deep inelastic scattering process allow access to the three-dimensional structure of nucleon. Here, a crucial role is played by fragmentation functions, such as Collins function, that parametrize the quark hadronization process. Here we present a novel approach for microscopic modelling of the polarized quark hadronization. Using the quark-jet framework and spin matrix density formalism, we describe the spin transfer in the quark emission chain and the produced hadron momenta for multiple hadron emission process. We derived integral equations for both unpolarized and Collins fragmentation function in the limit of infinite number of produced hadrons. We also adapted this framework in Monte-Carlo simulation software of hadronization to include the quark spin and studied both one- and two-hadron fragmentation functions simultaneously, with input from the Nambu–Jona-Lasinio effective quark model.