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Fragmentation functions at e^+e^- colliders

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Fragmentation functions, describing the formation of hadrons from partons, are an indispensable tool in the interpretation of hadron-production data, e.g., in the investigation of nucleon structure via semi-inclusive deep-inelastic scattering. The cleanest process to access fragmentation functions is hadron production in electron-positron annihilation. However, little information can be derived on charge-separated fragmentation functions from single-inclusive hadron production. A better handle on the flavor contributions can be gotten by flavor correlations or tagging: the hadron type in one hemisphere puts constraints on the parton flavor in the other hemisphere and thus on the flavor decomposition of the hadronization process. This can be exploited in inclusive hadron-pair production in electron-positron annihilation. While two hadrons in the same hemispheres, e.g., originating from the same parton, open an avenue to an unusual class class of fragmentation functions, dihadron fragmentation functions, two hadrons in opposite hemispheres can be used for flavor, transverse-momentum, and polarization tagging of single-hadron fragmentation functions. I will review some of the activities on this subject, mainly by the BESIII and Belle collaborations.

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