Interpolating Spinors and Scattering Amplitudes between Instant and Front Forms of Relativistic Dynamics ZIYUE LI, MURAT AN, CHUENG-RYONG JI, North Carolina State University — Among the three forms of relativistic Hamiltonian dynamics proposed by Dirac in 1949, the instant form and the front form can be interpolated by introducing an interpolation angle between the ordinary time t and the light-front time $(t + z/c)/\sqrt{2}$. In this presentation, a general helicity spinor that interpolates between the instant form and the front form is derived from the general poincare algebra developed for any interpolation angle. Using the general helicity spinors for any interpolation angle, we calculated the $e^+e^- \to \mu^+\mu^-$ scattering amplitude and analyzed both the frame dependence and the interpolation angle dependence of each helicity amplitude. We also showed that the disappearance of the connected contributions to the current from the vacuum in the light-front dynamics is independent of the reference frame and should be distinguished from the usual result in the infinite momentum frame.

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