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**Singularity Structure of the Free-Free Radiative Transition Matrix Element.** D.B. USKOV, Louisiana State University, R.H. PRATT, University of Pittsburgh — Using the Lippman-Schwinger formalism we analyze the origin and derive general expressions for delta-function, pole-type and log-type singularities of 3D and radial free-free radiative transition matrix elements. We demonstrate how discrepancies between acceleration, velocity and length forms at singularities can arise due to non-commutation of some limiting procedures inherent in scattering theory. Using the phase-amplitude method, we obtain analytic properties of soft-photon free-free matrix elements and derive expressions for the general case of (fully, partially, and un-) screened Coulomb potentials.Results are used to analyze the structure of trajectories of zeroes of matrix elements in the plane of incident and final energies) in the soft-photon regime.

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