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Introduction to Electromagnetic Fields and Geodesics in a Tokamak STEPHEN SHARMA, Univ. of Calif. Berkeley, Univ. of Southern California — Photons mediate electromagnetic radiation such that electric and magnetic particles obey the principle of least action from the applied fields. Elastic and inelastic collisions arise after summation of Lagrangian geodesics. In the case of reacting tritium and deuterium, energy is released in the form of electromagnetic radiation, neutrons, and alpha particles. Within fusion tokamaks, alpha particle energies determine if a self sustaining reaction—or ignition—will proceed. If particle mean free path is confined by electric and magnetic fields, then fusion occurs at higher frequencies. If temperature is increased and particle velocity is increased, then collision frequency increases. Modeling the nucleons as polarizable quark dielectric liquid drops increases differentiation between scattering events and fusion. When the cross section of two reactant liquid drops is coincident, fusion occurs. If cross sections do not overlap sufficiently, Coulomb scattering occurs. One strives for understanding of geometric approaches to solving for reactants' cross sections and fusion collision frequency in order to determine power output per particle and critical density of reactants.

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