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Time ordering in atomic collisions J.H. MCGUIRE, Tulane, A.L. GODUNOV, ODU, KH KH SHAKOV, L. KAPLAN, A. BURIN, D. USKOV, Tulane — Time ordering constrains interactions to occur in increasing (or decreasing) order. This places a constraint on the time evolution of the system and can lead to correlations in time of different particles in a few/many body system. Unlike overall time reversal, time ordering is not a conserved symmetry of the atomic system. A number of examples of observable effects of time ordering are presented. A convenient way to describe time ordering is to define the limit of no time ordering by replacing the instantaneous interaction by its time average. This is similar to the way in which spatial correlation is defined. Like spatial correlation, time ordering is usually formulated in the interaction representation. The effects of time ordering can differ in different representations. In energy space, conjugate to time space, time ordering is imposed as the $i\epsilon$ term in the Greens' function that corresponds to an initial condition (usually incoming plane waves and outgoing scattered waves). This permits off-energy-shell (energy non- conserving) fluctuations during the collision consistent with the Uncertainty Principle.

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