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Charged Particle Stopping Power Effects on Ignition: An Exact Calculation

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Using a new technique designed to capture both long and short distance physics in a completely finite manner, I will calculate the charged particle stopping power exactly to leading and next-to-leading order in the plasma number density, including an exact treatment of two-body quantum scattering. I should emphasize that this is not a model but a systematic calculation that provides an estimate of its own error and its domain of applicability. This calculation is extremely accurate in the plasma regime realized during ICF ignition, and the 3.5 MeV alpha particle range tends to be 30 to 40% longer than most models in the literature have predicted. This increases the ρ -R required for ignition.