Short-Time Dynamics of Neutral Ultra-Cold Plasmas

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One of the novel features of neutral ultracold plasmas is that they are highly nonequilibrium, very strongly coupled systems. I will discuss the relaxation of these systems, paying particular attention to features that lead to disorder-induced heating and temperature oscillations. Following some simple analytical results I will show detailed results from both Yukawa and two-component plasma molecular dynamics. In particular, I will show how the physics of temperature oscillations is revealed in quantities such as the velocity distribution function and the radial distribution function. I will conclude with an outlook of other interesting physics issues that might be explored in these novel plasmas.