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Kinetic Decoupling and Small Scale Structure in Effective Theories of Dark Matter JONATHAN CORNELL, University of California, Santa Cruz, STEFANO PROFUMO, WILLIAM SHEPHERD, Santa Cruz Institute for Particle Physics — After WIMP dark matter chemically decouples, setting its relic density, it remains in *kinetic* equilibrium due to scattering processes with standard model particles. The temperature at which it then kinetically decouples sets the size of the smallest dark matter collapsed structure, or protohalo, which could form in the early universe. While previous work has focused on calculating the temperature of kinetic decoupling for specific models of particle physics beyond the standard model, in this talk I will present results for more general calculations where the interactions between WIMPs and standard model particles can be described by an effective field theory. With these results, I will present constraints on the size of the protohalos from a variety of direct and collider probes of particle dark matter. I will also discuss recent claims that kinetic decoupling can be a way to resolve the "missing satellites problem" of the Milky Way.

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