Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

**Exact phoretic interaction of two chemically active particles** BABAK NASOURI, RAMIN GOLESTANIAN, Max Planck Institute for Dynamics and Self-Organization — We study the nonequilibrium interaction of two isotropic chemically active particles taking into account the exact near-field chemical interactions as well as hydrodynamic interactions. We identify regions in the parameter space wherein the dynamical system describing the two particles can have a fixed point; a phenomenon that cannot be captured under the far-field approximation. We find that, due to near-field effects, the particles may reach a stable equilibrium at a nonzero gap size or make a complex that can dissociate in the presence of sufficiently strong noise. We explicitly show that the near-field effects originate from a self-generated neighbor-reflected chemical gradient, similar to interactions of a self-propelling phoretic particle and a flat substrate.

Babak Nasouri
Max Planck Institute for Dynamics and Self-Organization

Date submitted: 29 Jul 2020 Electronic form version 1.4