The chaotic interaction of two walkers[1] LOIC TADRIST, NARESH
SAMARA, PETER SCHLAGHECK, TRISTAN GILET, Univ de Liege — A droplet
bouncing on a vertically vibrated bath may be propelled horizontally by the Faraday
waves that it generates at each rebound. This association of a wave and a particle
is called a walker. Ten years ago, Yves Couder and co-workers noted that the
dynamical encounter of two walkers may lead to either scattered trajectories or
orbital motion.
In this work, we investigate the interaction of two walkers more systematically. The
walkers are launched towards each other with finely controlled initial conditions.
Output trajectories are classified in four types: scattering, orbiting, wandering and
complex. The interaction appears stochastic: the same set of initial parameters
(to the measurement accuracy) can produce different outputs. Our analysis of the
underlying chaos provides new insights on the stochastic nature of this experiment.

Loc Tadrist
Univ de Liege

Date submitted: 12 Jul 2016   Electronic form version 1.4