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Walking with coffee: when and why coffee spills HANS C. MAYER, ROUSLAN KRECHETNIKOV, University of California at Santa Barbara — In our busy lives, almost all of us have to walk with a cup of coffee. Needless to say, under certain conditions we spill that precious liquid. This is a common example of the interplay between the mechanics of the complex motion of a walking individual and the fluid dynamics of a low viscosity liquid contained in a cup. We report on the results of an experimental investigation undertaken to explore the particular conditions under which coffee spills. Frame-by-frame analysis of recorded movies helps to elucidate the trajectory of the cup for various walking speeds and initial liquid levels. These kinematics, including both regular and irregular motions, are connected to instances during walking that result in spilled liquid. The coupling between mechanical aspects of walking and the fluid motion are analyzed based on which we determine a basic operational space with which one can confidently walk with cup in hand.

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