

Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

The aerodynamics of jumping rope JEFFREY ARISTOFF, HOWARD STONE, Department of Mechanical and Aerospace Engineering, Princeton University — We present the results of a combined theoretical and experimental investigation of the motion of a rotating string that is held at both ends (i.e. a jump rope). In particular, we determine how the surrounding fluid affects the shape of the string at high Reynolds numbers. We derive a pair of coupled non-linear differential equations that describe the shape, the numerical solution of which compares well with asymptotic approximations and experiments. Implications for successful skipping will be discussed, and a demonstration is possible.

Jeffrey Aristoff
Dept of Mechanical and Aerospace Engineering, Princeton University

Date submitted: 10 Aug 2010

Electronic form version 1.4