Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Control of fluidic environments by mushrooms EMILIE DRESSAIRE, JUNIUS SANTOSO, LISA YAMADA, Trinity College, MARCUS ROPER, UCLA — Thousands of fungal species rely on mushrooms for spore release and dispersal. Long distance spore dispersal by wind is instrumental to maintain genetic diversity and to the spread of pathogenic species. The conventional view is that fungi enjoy little control over the mechanism of dispersal. A spore falling from the mushroom cap can only hope to be picked up by a favorable airflow and carried away from the gap between the mushroom cap and the ground. We show that fungi actively manipulate their local fluidic environment by altering the buoyancy of the air surrounding the mushroom using a combination of water vapor and active cooling. This manipulation allows spore escape and dispersal from caps that may be spaced a few millimeters above the ground, or apart from each other. Through high speed videography, scaling analysis and indirect measurements, we reveal the fluid mechanics of spore escape, and how they are controlled by the biophysical properties of the mushroom.

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Date submitted: 02 Aug 2013 Electronic form version 1.4