

Abstract Submitted  
for the DFD09 Meeting of  
The American Physical Society

**A novel way to measure molecular diffusivity**<sup>1</sup> THOMAS PEACOCK, MICHAEL ALLSHOUSE, MIT — We present a new technique for measuring molecular diffusivity. The method exploits the phenomenon of diffusion-driven flow, in which buoyancy-driven convection occurs on sloping surfaces due to the diffusive-flux boundary condition affecting the local fluid density. By measuring the volume flux drawn into the boundary layer flow on a sloping surface, and exploiting the properties of an analytical solution, the molecular diffusivity is determined. The results are compared with predictions from numerical simulations. This approach allows one to readily investigate such issues as the effect of concentration on molecular diffusivity.

<sup>1</sup>This work is supported by the NSF.

Thomas Peacock  
MIT

Date submitted: 05 Aug 2009

Electronic form version 1.4