Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Free-surface microfluidics for detection of airborne explosives CARL MEINHART, BRIAN PIOREK, SEUNGJOON LEE, SANJOY BANERJEE, MARTIN MOSKOVITS, UC - Santa Barbara, JUAN SANTIAGO, Stanford University — A novel microfluidic, remote-sensing, chemical detection platform has been developed for real-time sensing of airborne agents. The key enabling technology is a newly developed concept termed Free-Surface Fluidics (FSF), where one or more fluidic surfaces, confined by surface tension forces, are exposed to the surrounding atmosphere. The free-surface fluidic architecture can be combined with Surface-Enhanced Raman Spectroscopy (SERS) to allow the real-time profiling of atmospheric species and detection of airborne agents. Results indicate that 4-aminobenzenethiol, a chemical species similar in size and structure to trinitrotoluene (TNT), is readily detected by the SERS system which employs Free-Surface Fluidics to continuously detect the presence of gas-phase species.

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Date submitted: 07 Aug 2006 Electronic form version 1.4