

Abstract Submitted  
for the DAMOP06 Meeting of  
The American Physical Society

**$^7\text{Li}$  BEC in a millimeter-scale Ioffe-Pritchard trap** MINGCHANG LIU, RUQUAN WANG, FRANCESCO MINARDI, MARK KASEVICH, Department of Physics, Stanford University, Stanford CA , 94305 — A millimeter-scale Ioffe-Pritchard type magnetic trap with excellent optical access has been used to demonstrate Bose-Einstein condensation in  $^7\text{Li}$ . The trap utilizes a novel combination of free space and substrate patterned current carrying elements to produce the required fields. Substrate electrodes are fabricated with using the direct-bond copper (DBC) process on a ceramic substrate. DBC fabrication enables excellent thermal dissipation together with high current capacity vias and surface conductors. With 100A trapping current, which dissipates less than 10W the trap provides 400G/Cm magnetic gradient in the radial direction, 50Hz trapping frequency in axial direction and 80G trap depth for  $^7\text{Li}$ . With conventional water cooling, lifetime for the trap is over 1 minute and BEC regime is reached after 35s forced evaporation. The demonstrated performance for  $^7\text{Li}$  is expected to scale well to other alkalis and this compact configuration may serve as an excellent platform for mobile ultra-cold atom sensors.

Mingchang Liu

Date submitted: 26 Jan 2006

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