Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Carbon nanotube based sharp tips and soldering irons ABHA MISRA, Graduate Aeronautical Laboratories (GALCIT), California Institute of Technology, Pasadena, CA, 91125, CHIARA DARAIO, Graduate Aeronautical Laboratories (GALCIT), and Applied Physics, California Institute of Technology, Pasadena, CA, 91125 — High energy electron beam machining has been proven a powerful tool to modify desired nanostructures for technological applications and to form molecular junctions and interconnections between carbon nanotubes. The development of the next generation of miniaturized electronic systems demands the integration of nanoelectronic components creating reliable mechanical and electrical contacts. At the same time, the development of scanning probe techniques and magnetic recording media require an ever decreasing tip size of ultrasharp magnetic read-write heads. We report on the nano-electron beam assisted fabrication of atomically sharp iron-based tips and on the creation of a nano-soldering iron for nano-interconnects using Fe-filled multiwalled carbon nanotubes (MWCNTs). Our technique allows also carving a MWCNT into a nanosoldering iron that was demonstrated capable of joining two separated halves of a tube. This approach could easily be extended to the interconnection of two largely dissimilar CNTs, between a CNT and a nanowire or between two nanowires.

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Date submitted: 25 Nov 2008 Electronic form version 1.4