Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

A Comparative Study of Au-Au, Ru-Ru and RuO_2-Au RF MEMS Contacts in Controlled Vacuum Environments[1] MATTHEW WALKER, J. KRIM, N. MCGRUER, North Carolina State University — We have constructed an UHV system with in situ oxygen plasma cleaning capabilities in order to observe the impact of film contamination in reproducible conditions. We have performed measurements to allow comparison of soft, hard and combined soft-hard contacts. All switches are closed before applying a potential across the contacts to minimize e-field evaporation and material transfer between contacts. Prior to, and for short O2 plasma exposure times, the initial contact resistance measurements had larger variations. With longer O2 plasma exposure times initial and extrapolation resistances measurements converged. These results are consistent with prior reports, which showed that the oxide layer on a Ru surface thickens with exposure to O2 plasma [1]. Therefore, under stringent experimental conditions, we have demonstrated that operating RF MEMS contacts are comparable to those studied in the surface science literature. [1] Y. Iwasaki, A. Izumi, H. Tsurumaki, A. Namki, H. Oizumi, I. Nishiyama, *Appl. Surf. Sci.* ***253***, 2007

[1]Supported by DARPA Grant # HR0011-06-1-0051 and MURI Grant #FA9550-04-0381.

Matthew Walker
North Carolina State University

Date submitted: 29 Nov 2008 Electronic form version 1.4