

Abstract Submitted
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Tribo-induced melting transitions at sliding tungsten/gold-nickel asperity contacts LIMING PAN, Department of physics, North Carolina State University, DANIEL LICHTENWALNER, Department of Materials Science and Engineering, North Carolina State University, ANGUS KINGON, Brown University, JACQUELINE KRIM, Department of Physics, North Carolina State University — Tribo-induced nanoscale surface melting mechanisms have been investigated by means of a combined QCM-STM technique [1] for a range of Au and Au-Ni alloys with varying compositional percentages and phases. A transition from solid- solid to solid-“liquid like” contact[1] was observed for each sample at sufficiently high asperity sliding speeds. Pure gold, solid-solution and two-phase Au-Ni (20 at.% Ni) alloys were compared, which are materials of great relevance to MEMS RF switch technology [2]. The transition points agree favorably with theoretical predictions for their surface melting characteristics. We acknowledge NSF and AFOSR support for this research.

- [1] B. D. Dawson, S. M. Lee, and J. Krim, Phys. Rev. Lett. 103, 205502 (2009)
[2] Zhenyin Yang; Lichtenwalner, D.J.; Morris, A.S.; Krim, J.; Kingon, A.I, Journal of Microelectromechanical Systems, April 2009, Volume: 18 Issue:2, 287-295

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