Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Interlayer magnetoresistance as a probe of the quantum coherence of electronic excitations in layered metals MALCOLM KENNETT, Simon Fraser University, ROSS MCKENZIE, University of Queensland — Angle-dependent magnetoresistance oscillations (AMRO) have been used as a powerful tool to map out Fermi surfaces in layered metals, such as organic metals, strontium ruthenate, and an over-doped cuprate. We derive a general formula for AMRO in systems with anisotropic interlayer hopping, anistropic in-plane scattering and an anisotropic $2d$ Fermi surface. We discuss the ability of AMRO to discriminate between coherent transport when there is a $3d$ Fermi surface and weakly incoherent transport, where there is hopping between $2d$ Fermi surfaces that are only defined in each layer. We illustrate these ideas by comparison with experimental measurements of AMRO in thallium cuprate [1].
[1] N. E. Hussey *et al.*, Nature **425**, 814 (2003).

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Date submitted: 05 Dec 2005 Electronic form version 1.4