Abstract Submitted
for the NEF08 Meeting of
The American Physical Society

Positronium Quenching with Nitric Oxide Targets: A Theoretical Study of Spin Coupling SUDHA SWAMINATHAN, Worcester State College, DAVID SCHRADER, Marquette University — A single elastic collision between an *ortho* positronium beam and a nitric oxide target is considered. The spin coupling between *ortho* positronium and the doublet ground state of nitric oxide leading to the production of both *para* and *ortho* positronium is studied. Angular momentum coupling and density matrix techniques are used to calculate the probabilities of forming *para* and *ortho* positronium in terms of total-electron-spin-dependent scattering amplitudes. The results are used to estimate the fraction of the incoming *ortho* positronium that has been converted to *para* positronium due to the exchange of the unpaired electron of the nitric oxide target with the electron of the incoming *ortho* positronium.

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Date submitted: 30 Sep 2008 Electronic form version 1.4