

Abstract Submitted  
for the TSF10 Meeting of  
The American Physical Society

**Apparatus for the analysis of surfaces in gas environments using Positron Spectroscopy**<sup>1</sup> SUMAN SATYAL, LAWRENCE LIM, VIBEK JOGLEKAR, SUSHANT KALASKAR, KARTHIK SHASTRY, ALEX WEISS — Positron spectroscopy performed with low energy beams can provide highly surface specific information due to the trapping of positrons in an image potential surface state at the time of annihilation. Here we describe a spectrometer that will employ differential pumping to enable us to transport the positrons most of the way from the source to the sample under high vacuum and then to traverse a thin gas layer surrounding the sample. The positrons will be implanted into the sample at energies less than  $\sim 10$  keV ensuring that a large fraction will diffuse back to the surface before annihilation. The Elemental content of the surface interacting with the gas environment will then be determined from the Doppler broadened gamma spectra. This system will include a time of flight positron annihilation induced Auger spectrometer (TOF-PAES) which correlates with the Doppler measurements at lower pressures.

<sup>1</sup>The Welch Foundation Y-1100, NSF DMR 0907679

Suman Satyal

Date submitted: 24 Sep 2010

Electronic form version 1.4