Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

**Hybrid theory of $D$-wave electron-hydrogenic systems and photoabsorption in two-electron systems** A.K. BHATIA, NASA/Goddard Space Flight Center — A variational wave function incorporating short range correlations via Hylleraas type functions plus long-range polarization terms of the polarized orbital type but with smooth cut-off factors has been used to calculate D-wave phase shifts for electron scattering from H, $He^+$, and $Li^{+2}$. This approach gives the direct $r^{-4}$ potential and a non-local optical potential which is negative definite. The resulting phase shifts have rigorous lower bonds and the convergence is much faster than those obtained without the modification of the target function. The continuum functions obtained for the $D$- and S-waves have been used to calculate photoabsorption cross sections of the $P$ states in He, and $Li^+$. These cross sections have been used to calculate recombination rate coefficients. Final results will be presented at the conference.

A.K. Bhatia
NASA/Goddard Space Flight Center

Date submitted: 29 Jan 2014 Electronic form version 1.4