Abstract Submitted
for the GEC08 Meeting of
The American Physical Society

Alignment relaxation of Ne*($2p_i$[J=1]) atoms due to collisions with He($1s^2$) atoms VAIBHAV KHADILKAR[1], Lamar University, HIRAKU MATSUKUMA, MASAHIRO HASUO, Kyoto University, CRISTIAN BAHRIM, Lamar University — Alignment relaxation of atoms induced by collisions offers accurate information regarding the anisotropic atom-atom potentials and has many applications in atomic and plasma physics. Here we report the energy-averaged cross sections for destruction of alignment $\sigma^{(2)}$ and the rate coefficients for disalignment K_{DA} of $Ne^*(2p^5\ 3p;\ 2p_i$ [J=1]) atoms due to He atom collisions using a many-channels close-coupling method based on a modified model potential for the $HeNe^*(2p^5\ 3p)$ system [1]. Comparison with measurements using laser-induced fluorescence spectroscopy (LIFS) [2] and Hanle signals [3] is reported. The LIFS method measures K_{DA} due to intra-multiplet transitions, while the analysis of Hanle signals gives $\sigma^{(2)}$, which incorporates both the intra- and inter-multiplet transitions. Good agreement between theory and experiments was found for the $2p_2$, $2p_5$, and $2p_7$ states at 77 K < T < 350 K when a static polarizability for each $Ne^*(2p_i)$ state is added to the long-range potentials of the $HeNe^*(2p^5\ 3p)$ system given in Ref.[4]. [1] Bahrim C and Khadilkar V 2008 *J. Phys. B* **41** 035203 [2] Seo M, Shimamura T, Furatani T, Hasuo M, Bahrim C and Fujimoto T 2003 *J. Phys. B* **36** 1885 [3] Carrington C G and Corney A 1971 *J. Phys. B* **4** 869 [4] Bahrim C, Kucal H and Masnou-Seeuws F 1997 *Phys. Rev. A* **56** 1305

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Date submitted: 17 Jun 2008 Electronic form version 1.4