Abstract Submitted
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Measuring the role of alignment in a molecule optical lens SIMON M. PURCELL, PETER F. BARKER, University College London — Far off-resonant pulsed lasers have been used to deflect and focus molecules via the optical dipole force, which is proportional the effective polarisability of the species [1]. Molecules have an anisotropic polarisability, which in the presence of an intense linearly polarised optical field (10^{12} Wcm^{-2}) causes the molecule to align with the field polarisation vector. This alignment occurs due to the creation of pendular states which are a superposition of the field free rotational states of the molecule[2]. This alignment of the molecule with the electric field can result in a higher effective polarisability leading to an increased dipole force that can be used to tailor the properties of molecular optical elements. Using this property, we are studying how the field polarisation can be used to modify the focal length of the molecule optical lens, created by a focused laser beam. We will present calculations of this process and a comparison with our experiments on cold (3 K) carbon disulphide molecules focused by a Nd:YAG laser beam. [1] H.S Chung, B.S Zhao, S.H. Lee *et al.,* J. Chem. Phys **114,** 8293 (2001) [2] B. Friedrich, D. Herschbach, J. Phys. Chem. **99,** 15686 (1995)

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