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Measuring atomic oscillator strengths by single atom spectroscopy JIANWEI LEE, SYED ABDULLAH ALJUNID, MENG KHOON TEY, BRENDA CHNG, GLEB MASLENNIKOV, CHRISTIAN KURTSIEFER, National University of Singapore — We propose a method for obtaining the oscillator strengths of atomic transitions based on single atom spectroscopy. The method is based on a direct measurement of an AC Stark shift of atomic energy levels for a single atom trapped in an optical tweezer [1]. The method is independent of the knowledge of the trapping field at the atom. The results can be applied to obtain the previously unknown oscillator strengths for dipole transitions involving the first excited state of alkali metals. [1] M. K. Tey, Z. Chen, S. A. Aljunid, B. Chng, F. Huber, G. Maslennikov and C. Kurtsiefer, *Strong interaction between light and a single trapped atom without the need for a cavity*, Nature Physics 4, 924(2008)

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