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Theoretical study of the vibration-dependent electron anisotropy in O_2^- photodetachment[1] MICHAL TARANA, CHRIS H. GREENE, Department of Physics and JILA, University of Colorado, Boulder, Colorado 80309-0440, USA — Recent experimental work [1] reports observation of a significant vibrational dependence of the photoelectron angular distributions (PADs) recorded for the $O_2(X^3\Sigma_g^?)$ $\leftarrow O_2^-(X^2\Pi_g)$ band. It is the aim of the theoretical model presented here to reproduce the experimental results, allow for a deeper insight into the mechanism of this process and explain the sensitivity of the PAD to vibronic coupling in the anion ground electronic state. The vibrational dynamics is treated using the vibrational frame transformation [2], the K-matrices in the fixed-nuclei approximation are obtained from the *ab initio* molecular R-matrix calculations.

[1] R. Mabbs *et al.*, Phys. Rev. A 82 011401(R) (2010).
[2] H. Gao and C.H. Greene, Phys. Rev. A 42, 6946 (1990).

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Michal Tarana
Dept of Physics and JILA, University of Colorado,
Boulder, Colorado 80309-0440, USA

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