RELATIVISTIC JAHN-TELLER EFFECTS IN THE QUARTET STATES OF K\textsubscript{3} AND RB\textsubscript{3}: A VIBRATIONAL ANALYSIS OF THE 2\textsuperscript{4}E' \leftarrow 1\textsuperscript{4}A'_2 ELECTRONIC TRANSITIONS BASED ON AB INITIO CALCULATIONS

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We apply the Multireference Rayleigh Schrödinger Perturbation Theory of second order to obtain the adiabatic potential energy surface of the 1\textsuperscript{4}A'_2 electronic groundstate and the 2\textsuperscript{4}E' excited state of K\textsubscript{3} and Rb\textsubscript{3}. Both trimers show a typical E\textsuperscript{x}e Jahn-Teller distortion in their 2\textsuperscript{4}E' state, which is analyzed in terms of the relativistic Jahn-Teller effect theory. Linear, quadratic as well as spin-orbit coupling terms are extracted from the \textit{ab initio} results and used to obtain theoretical spectra for a direct comparison to laser-induced fluorescence and magnetic circular dichroism spectra of alkali-doped helium nanodroplets [Auböck et al. J. Chem Phys. \textbf{129} 114501 (2008)].