O₂ ENERGY LEVELS, BAND CONSTANTS, POTENTIALS, FRANCK-CONDON FACTORS AND LINELISTS INVOLVING THE $X^3\Sigma_g^-$, $a^1\Delta_g$ AND $b^1\Sigma_g^+$ STATES

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The isotopically invariant Dunham fit of O₂ was updated with newly reported literature transitions to derive (1) the energy levels, band-by-band molecular constants and RKR potentials for the $X^3\Sigma_g^-$, $a^1\Delta_g$ and $b^1\Sigma_g^+$ states of the six O₂ isotopologues, $^{16}\text{O}\,^{16}\text{O}$, $^{16}\text{O}\,^{17}\text{O}$, $^{16}\text{O}\,^{18}\text{O}$, $^{17}\text{O}\,^{17}\text{O}$, $^{17}\text{O}\,^{18}\text{O}$ and $^{18}\text{O}\,^{18}\text{O}$; (2) the line positions and Franck-Condon factors for their $a^1\Delta_g - X^3\Sigma_g^-$, $b^1\Sigma_g^+ - X^3\Sigma_g^-$ and $a^1\Delta_g - b^1\Sigma_g^+$ band systems. The best available experimental and theoretical data were used as input for calculating intensities of lines involving the $X^3\Sigma_g^-$, $a^1\Delta_g$ and $b^1\Sigma_g^+$ states. The newly calculated positions and intensities are combined to provide HITRAN-format linelists.