OSCILLATOR STRENGTHS IN THE VISIBLE ABSORPTION SPECTRUM OF I_2

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The $B - X$ transition in I_2 stands as one of the most precisely characterized diatomic electronic systems, with thousands of lines having been measured with precision sufficient to serve as frequency standards across the 500-700-nm spectral region. Accordingly the molecular constants of the $B-X$ system permit recalculation of those line positions with similar precision (0.001 cm^{-1}). Yet the $B-X$ electronic transition strength remains a 10-percent quantity, in part from the difficulty of dealing with two overlapping continuous 1u-X transitions, $A - X$ and $C - X$. In this work, oscillator strengths are estimated from a long-known but little used method – integration of absorption cross sections over single rotational lines – using measurements obtained for lines near 650 nm with a diode laser. The results are combined with new, precise low-resolution (1 nm) absorption data to obtain a refined assessment of electronic transition strengths in the I_2 visible absorption spectrum.