HIGH-RESOLUTION SPECTROSCOPY OF THE $2^2\Pi_u \leftarrow X^4\Sigma_g^-$ FORBIDDEN TRANSITIONS OF C_2^+

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The electronic absorption spectrum of the (0,2), (1,3), and (6,9) bands of the $B^4\Sigma_u^- - X^4\Sigma_g^-$ system of C_2^+ was obtained using the velocity modulation technique in conjunction with heterodyne detection. The rotationally resolved spectrum shows perturbations, which are attributed to the $2^2\Pi_u$ state. The mixing between the $B^4\Sigma_u^-$ state and the $2^2\Pi_u$ state for nearly degenerate levels generated enough intensity borrowing to observe twenty $2^2\Pi_u \leftarrow X^4\Sigma_g^-$ forbidden transitions. The bands, with their corresponding forbidden transitions, were fit to a model Hamiltonian. Line position measurements, line strength factors, and expectation values for the orbital angular momentum, $\langle\Lambda'\rangle$, for the forbidden transitions are reported. Molecular parameters from the global fit of each band, including their corresponding forbidden transitions, are reported.