Electron Impact Excitation of Molecular Nitrogen: Excitation of the $C^3\Pi_u$, $E^3\Sigma_g^+$, and $a^\prime\prime\,1\Sigma_g^+$ States and Vibrationally-Resolved Excitation of the $C^3\Pi_u (\nu')$ State$^1$ C.P. MALONE$^2$, P.V. JOHNSON, J.A. YOUNG, I. KANIK, Jet Propulsion Laboratory, Caltech, MS 183-601, 4800 Oak Grove Drive, Pasadena, CA 91109 USA, S. RAHMAN, UCLA, B. AJDARI, M.A. KHAKOO, Physics Department, Cal State Fullerton, 800 N. State College, Fullerton, CA 92834 USA — Differential cross sections (DCSs) were investigated for electron impact excitation of the $C^3\Pi_u$, $E^3\Sigma_g^+$, and $a^\prime\prime\,1\Sigma_g^+$ states from the ground state in $N_2$. The DCSs were obtained from new measurements of energy-loss spectra in the region of 10.75eV to 12.75eV measured at incident energies between 13eV and 100eV and for scattering angles ranging from 5° to 130°. Vibrationally-resolved DCSs are presented for electron impact excitation from the ground state to the $C^3\Pi_u (\nu')$ state, where $\nu'$=0, 1, 2, 3, and 4. Relative excitation probabilities for the vibrational levels of the $C^3\Pi_u$ state are shown to demonstrate non-Franck-Condon behavior for excitation energies less than approximately 50eV.

$^1$This work was carried out at CSUF and JPL, Caltech, under contracts with NASA and NSF.
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Date submitted: 27 Jan 2009