THE PERMANENT ELECTRIC DIPOLE MOMENTS OF THE $X^3\Delta$, $E^3\Pi$, $A^3\Phi$ AND $B^3\Pi$ STATES OF TITANIUM MONOXIDE, TiO

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The optical Stark spectrum of the origin bands of the $E^3\Pi_0 - X^3\Delta_1$, $A^3\Phi_2 - X^3\Delta_1$, and $B^3\Pi_0 - X^3\Delta_1$ band systems of titanium monoxide, TiO, were analyzed to produce permanent electric dipole moments of 3.34(1)D, 3.2(4)D, 4.89(5)D and 4.9(2)D for the $X^3\Delta_1$, $E^3\Pi_0$, $A^3\Phi_2$ and $B^3\Pi_0$ states, respectively. The observations are compared with a simple molecular orbital description for the low-lying states and electronic structure calculations.