Supplementary Information

Visualizing rotational wave functions of electronically excited nitric oxide molecules by using ion imaging technique

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Pump-probe delay dependence of the image

In the main text of this article, we have shown the images taken with the relatively long pump-probe delay of ~50 ns. We also carried out the measurements with shorter, ~ 5 ns delay (Fig. S1 and S2). Both Figs. S1d and S2d show similar trends to the Figs. 4d and 5d, respectively: Figure S1d shows anisotropic distribution along the UV pump polarization, while Fig. S2d shows an isotropic distribution. Note that the dark region always appears in the bottom of the images. This is due to the dead zone of the detector.

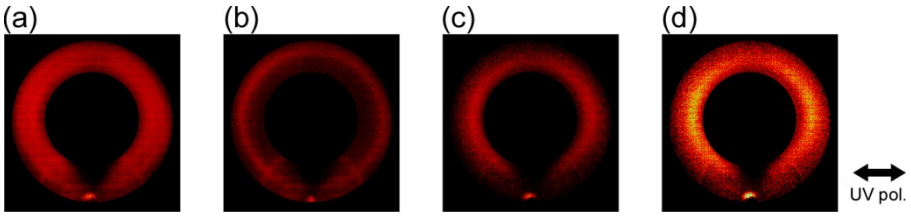

Figure S1 Dissociative ionization imaging of NO with a 44211 cm^{-1} UV pump ($R_{12}(1/2)$ transition). (a) N^+ ion image taken with a UV pump. (b) Probe-only N^+ ion image. (c) Difference image between the pump + probe image (a) and the probe-only image (b). (d) Brightness-amplified image of (c). Only N^+ ions from NO^{2+} were highlighted. The prepared state is $|N\ S\ J\ |M|\rangle = |2\ 1/2\ 3/2\ 1/2\rangle$.

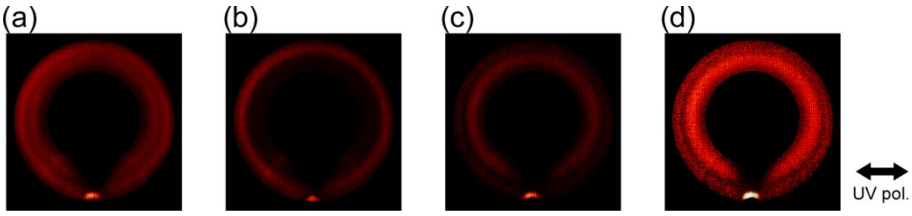

Figure S2 Dissociative ionization imaging of NO with a 44199 cm^{-1} UV pump ($Q_{1a}(1/2)$ transition). (a) N^+ ion image taken with a UV pump. (b) Probe-only N^+ ion image. (c) Difference image between the pump + probe image (a) and the probe-only image (b). (d) Brightness-amplified image of (c). Only N^+ ions from NO^{2+} were highlighted. The prepared state is $|N\ S\ J\ |M|\rangle = |0\ 1/2\ 1/2\ 1/2\rangle$.