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## Attosecond transient absorption spectroscopy of molecular hydrogen

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**Synopsis** We extend attosecond transient absorption spectroscopy (ATAS) to the study of hydrogen molecules, demonstrating the potential of the technique to resolve – simultaneously and with state resolution – both the electronic and nuclear dynamics.

Figure 1 consists of three panels. Panel (a) is a schematic of the pump-probe experiment. A pump pulse at 248 nm and a probe pulse at 193 nm are shown. The pump pulse is used to excite the sample, and the probe pulse is used to measure the photoelectron spectrum. Panel (b) is a 2D color plot of the photoelectron spectrum. The y-axis is Photon Energy (eV) from 11 to 19, and the x-axis is Delay (fs) from -80 to 20. The color scale ranges from 0.1 to 1.0. Panel (c) is a 2D color plot of the photoelectron spectrum. The y-axis is Wavelength [nm] from 70 to 110, and the x-axis is Time delay [fs] from -20 to 10. The color scale ranges from 0 to 3. The plot shows the evolution of the photoelectron spectrum over time, with various peaks labeled:  $1s\sigma_g$ ,  $D^+ \Pi_u$ ,  $J^+ \Delta_g$ ,  $B^+ \Sigma_u^+$ ,  $C^+ \Pi_u$ ,  $B^+ \Sigma_u^+$ ,  $E^+ \Sigma_g^+$ , and  $F^+ \Sigma_g^+$ .

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