Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Excited-state dynamics and fluorescence lifetime of cryogenically cooled green fluorescent protein chromophore anions: Supplemental Material

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1. PULSE SHAPER

A pulse shaper[1, 2] was used to reduce the photon-energy spread of the femto-second pump pulse. In general a pulse shaper consists of two parallel gratings with a telescope in between. In our case we used a single grating, an achromatic lens and a mirror as shown in Fig. S1. The distance between the lens and the mirror is fixed at the focal length. A pulse shaper can be used to change the chirp of a pulse by varying the distance between the grating and the lens. Here we kept the distance fixed to the focal length such that there were no chirp is induced. Instead a slit was placed after the lens to block part of the spectral width of the pulse. As the light goes back through the lens and grating the pulse retakes the original spatial shape with a reduced spectral width at a cost of increased temporal width. If the slit is left completely open such that no part of the laser pulse is blocked then the temporal and spectral widths of the outgoing pulse is identical to the ingoing pulse.

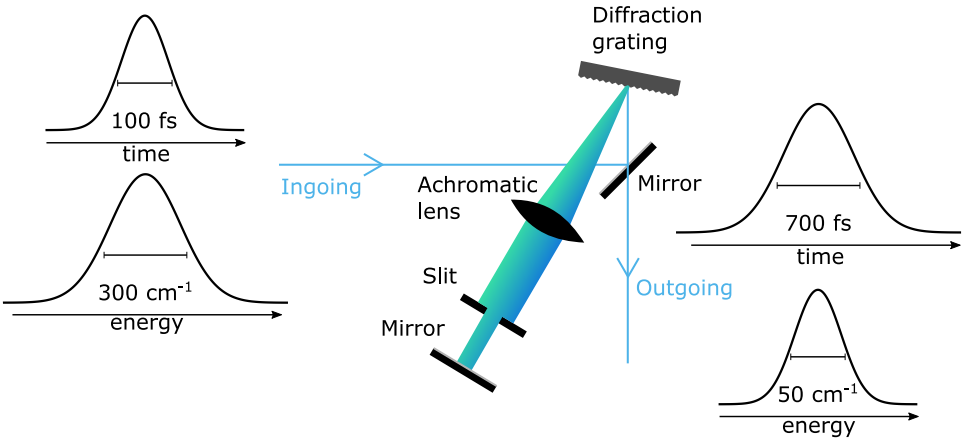

Fig. S1. Schematic of the pulse shaper. A small angle in the ingoing pulse onto the first mirror ensures that the outgoing pulse can pass over the top of the same mirror.

REFERENCES

1. P. Balling, D. J. Maas, and L. D. Noordam, "Interference in climbing a quantum ladder system with frequency-chirped laser pulses," Phys. Rev. A **50**, 4276–4285 (1994).
2. A. M. Weiner, J. P. Heritage, and E. M. Kirschner, "High-resolution femtosecond pulse shaping," J. Opt. Soc. Am. B **5**, 1563 (1988).