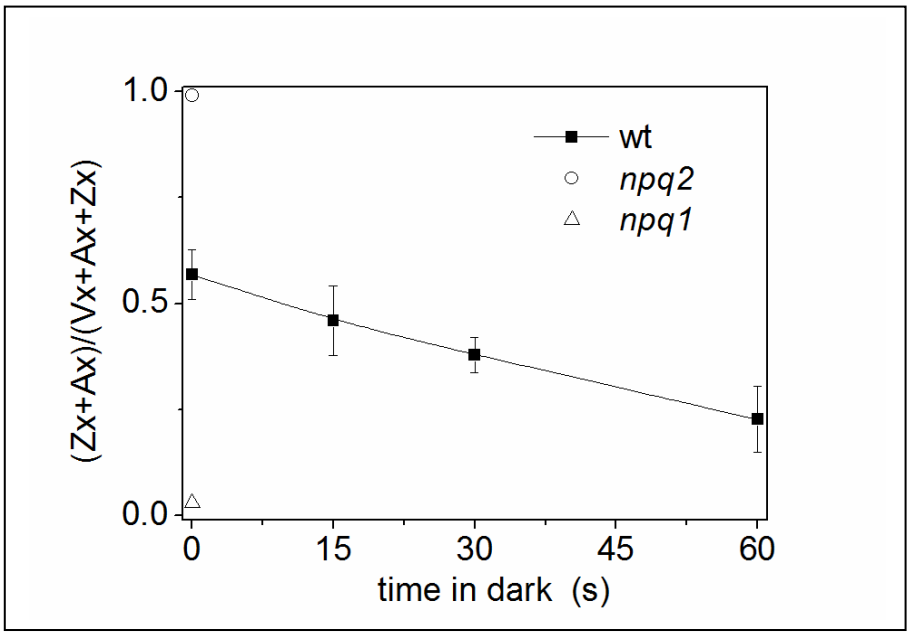
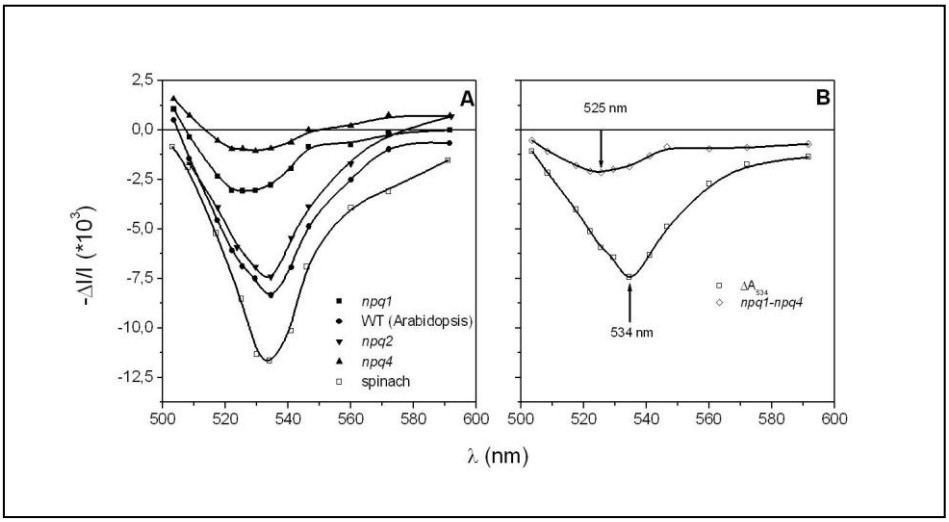
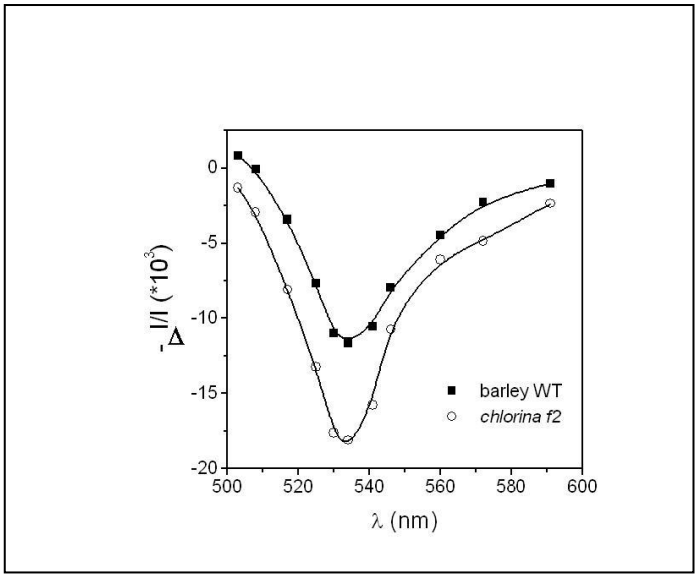
Supplementary Fig. 1. Changes in carotenoid composition in Arabidopsis leaves relaxing from steady-state illumination. Leaves were exposed to light (same conditions as in Figure 2, with no inhibitors added). Their pigment composition was measured in the light and during dark recovery by HPLC (1) at the indicated times. Triangles and circles show the levels of zeaxanthin in the *npq1* and *npq2* mutants (respectively), for comparison. s.e. refers to the mean of measurements on two biological samples.



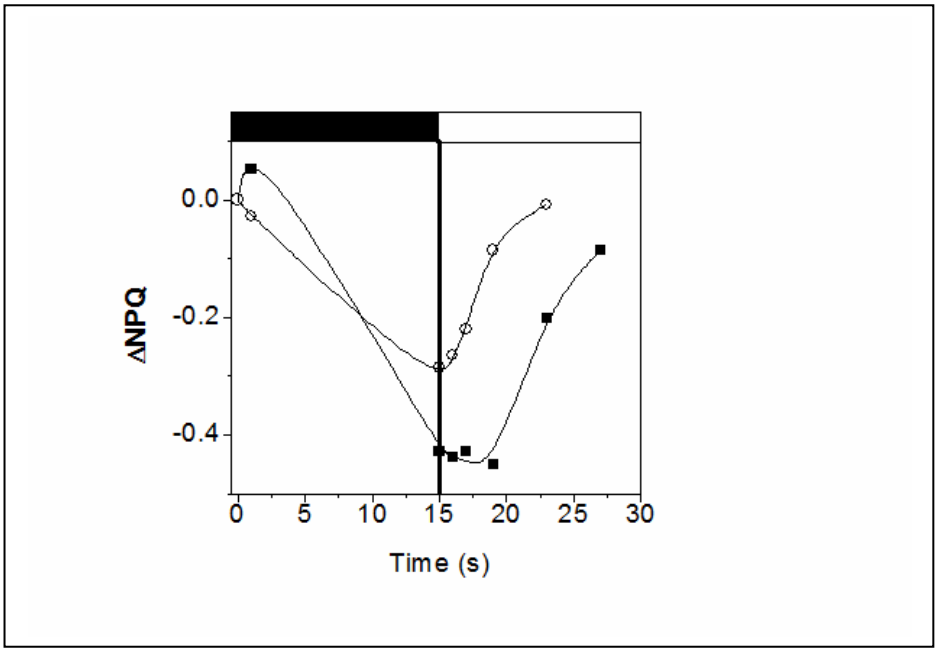
Supplementary Fig. 2. qE-related absorption difference spectra (steady state light minus 50 seconds of dark relaxation). A: *npq1* (solid squares), wild type (circles), *npq2* (downwards triangles), *npq4* (upwards triangles) leaves of Arabidopsis, and spinach leaves (open squares). B: absorption shift (ΔA_{535} signal) measured in Zx-loaded membranes (wt – *npq4*), and in Vx-loaded membranes (*npq1-npq4*).



Supplementary Fig. 3. qE-related absorption difference spectra (steady state light minus 50 seconds of dark relaxation) in wt and *chlorina f2* leaves of barley. Note that the larger amplitude of the ΔA_{535} shown in *clo-f2* reflects changes in the optical properties of the mutant leaves owing to its lower pigment content.



Supplementary Fig. 4. Changes in NPQ in barley leaves that were exposed to dark light cycles (15s light, 15 s dark). Squares: wt; circles: *clo-f2* Black bar: light off. White bar: light on. Due to the significant quenching extent in light exposed wt and *clo-f2* leaves, data are presented as ΔNPQ to allow a direct comparison of the traces.



Supplementary table 1. NPQ decay rates in Arabidopsis wt and *stn7* plants; Leaves were illuminated for 15 minutes (ki_{PSII} ~ 250 s^{-1}) to load them with zeaxanthin, and their NPQ decay was measured upon dark adaptation. Data were fitted with a sum of three exponential decay functions. s.e. refers to the mean of 3 independent measurements.

	WT	*STN7*
A_1	0.59 ± 0.05	0.58 ± 0.03
$\tau_{1\ (min)}$	1.02 ± 0.17	1.25 ± 0.20
A_2	0.27 ± 0.06	0.30 ± 0.02
$\tau_{2\ (min)}$	13.05 ±.1.78	13.09 ± 1.06
A_3	0.14 ± 0.05	0.12 ± 0.04
τ_3 (min)	> 30	> 30