



Figure 1. Combined measurements of gas exchange and chlorophyll fluorescence show the existence of O_2 recycling during the first minutes of illumination of anaerobically acclimated *C. reinhardtii*. (A) Relationship between the chlorophyll fluorescence parameter $\Delta F/F_{M'}$ and the apparent quantum yield of gross O_2 evolution established from simultaneous measurements of chlorophyll fluorescence by a PAM fluorimeter, and O_2 exchange by MIMS in the presence of [^{18}O]-enriched O_2 . The red line shows the linear regression for the $\Delta F/F_{M'}$ values lower than 0.58. The chlorophyll concentration was $20 \mu\text{g Chl mL}^{-1}$. Data were recorded after 10 minutes dark adaptation. (B) Combined measurements of H_2 and O_2 exchange during a dark to light ($660 \mu\text{mol photon m}^{-2} \text{ s}^{-1}$ green light) transient in 1.5h anaerobically acclimated WT cells. Measured net O_2 and H_2 evolution rates are shown as filled circles (blue and green, respectively). Gross O_2 evolution rates (black empty circles) were determined from $\Delta F/F_{M'}$ measurements based on the relationship established in (A), and O_2 uptake rates (red empty circles) from the difference between gross and net O_2 evolution rates. Right panel: box plots show gross O_2 evolution and O_2 uptake rates determined after 3 min of illumination (mean \pm SD, $n=5$ biological replicates).