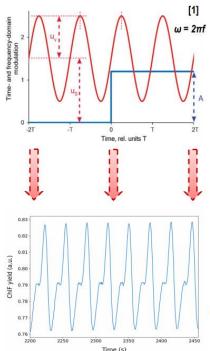


# Sensing the heat response of photosynthesis dynamics

# with forced oscillating light

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### 1. "Prologue"



## **INPUT**

0.150

0.125

0.100

0.075

0.050 0.025

0.000 0.000 -0.002 -0.004 -0.006

-0.008

-0.010 -0.012

0.020 0.015

0.010

0.005

0.000

0.02 0.04 0.06 0.08 0.10 0.12 0.14

Actinic light:  $u_t = u_0 + u_v \sin(2\pi f * t)$ Fast Fourier Transform (FFT) of actinic light

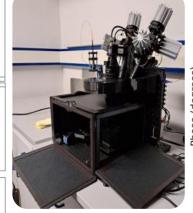


Fast Fourier Transform (FFT) of ChIF yield

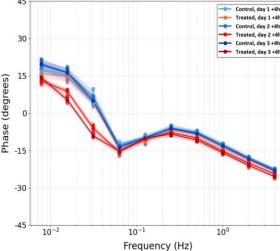
ChIF yield:  $F_t = F_s + F_v(f) \sin [(f * t - \Phi(f))]$ 

OUTPUT

## 2. "Journey"



### 3. "Climax"

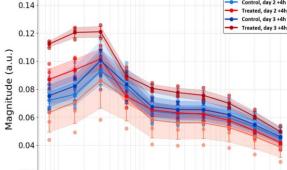




# 0.02

10-2

0.16



 $10^{-1}$ 

Frequency (Hz)

## 4. "Epilogue"

The use of a sinusoidal light that oscillates at selected frequencies allows to investigate the dynamics of the photosynthetic system through the measure and analysis of chlorophyll fluorescence yield (frequency-domain approach). Here, we demonstrate that this method can detect the frequency-dependent heat response of photosynthesis in A. thaliana WT plants.







10°