

## Spatiotemporal Metabolic Dynamics in Leaves of a CAM Plant

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The Crassulacean Acid Metabolism (CAM) plant *Kalanchoe daigremontiana* shows a circadian rhythm in its whole-leaf  $CO_2$  uptake [1]. Monitoring the chlorophyll fluorescence of photosystem II unveils the spatiotemporal distribution of the metabolic activity in the leaf underlying this rhythm [2].

Image series under continuous conditions of light and temperature are analyzed by pixelwise time-series analysis showing a heterogeneity of rhythm amplitudes, frequencies and phase relations within the leaf. Furthermore phase relations, correlations, and the degree of synchronization between the leaf points and with environmental quantities are unveiled [3]. The experimental data are compared with simulations of a population of phenomenological models of circadian oscillations.

The results suggest that observable dynamical patterns such as phase waves are most likely induced by gradients in environmental quantities, e.g. light intensity.

## References

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