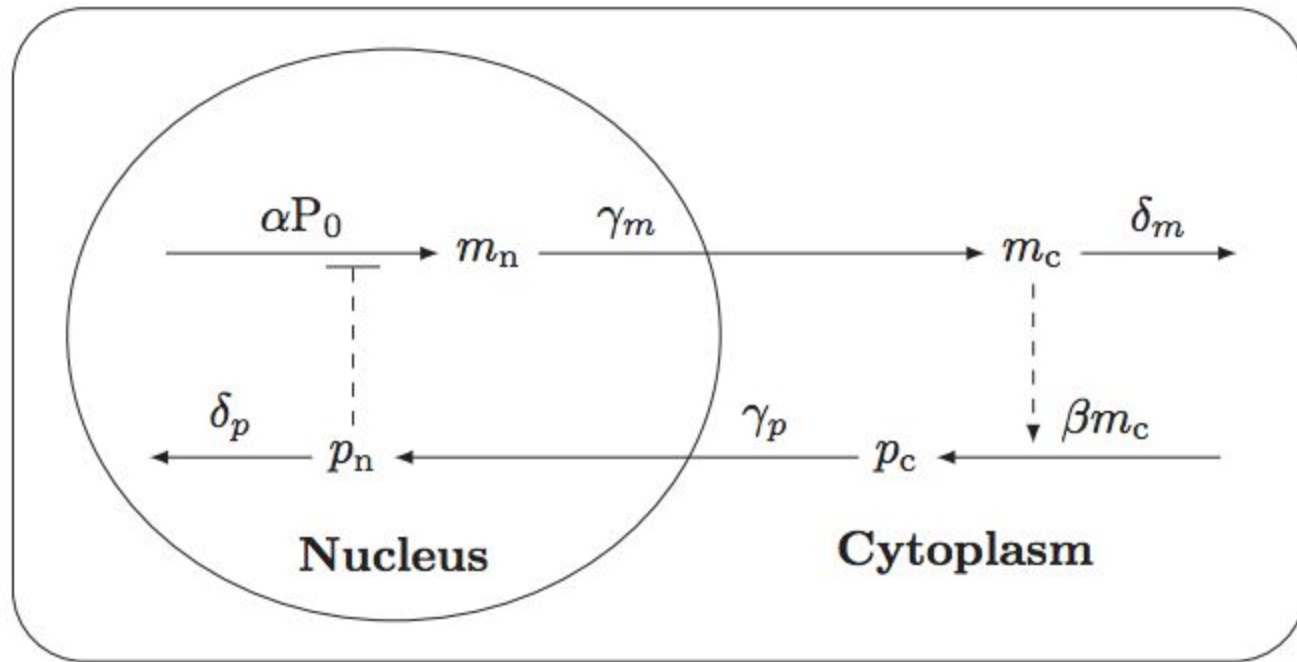


# Entrainment of a cellular circadian oscillator by light

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Project 2



Model

Reaction number	Reaction name	Rate (probability per unit time)	Result
1	Transcription of the <i>Per</i> gene	$\alpha P_0$	$m_n \rightarrow m_n + 1$
2	Export of mRNA from the nucleus	$\gamma_m m_n$	$m_n \rightarrow m_n - 1, m_c \rightarrow m_c + 1$
3	Degradation of mRNA (in the cytoplasm)	$\delta_m m_c$	$m_c \rightarrow m_c - 1$
4	Translation of <i>Per</i> mRNA	$\beta m_c$	$p_c \rightarrow p_c + 1$
5	Import of protein to the nucleus	$\gamma_p p_c$	$p_c \rightarrow p_c - 1, p_n \rightarrow p_n + 1$
6	Degradation of protein (in the nucleus)	$\delta_p p_n$	$p_n \rightarrow p_n - 1$

## Reaction Table

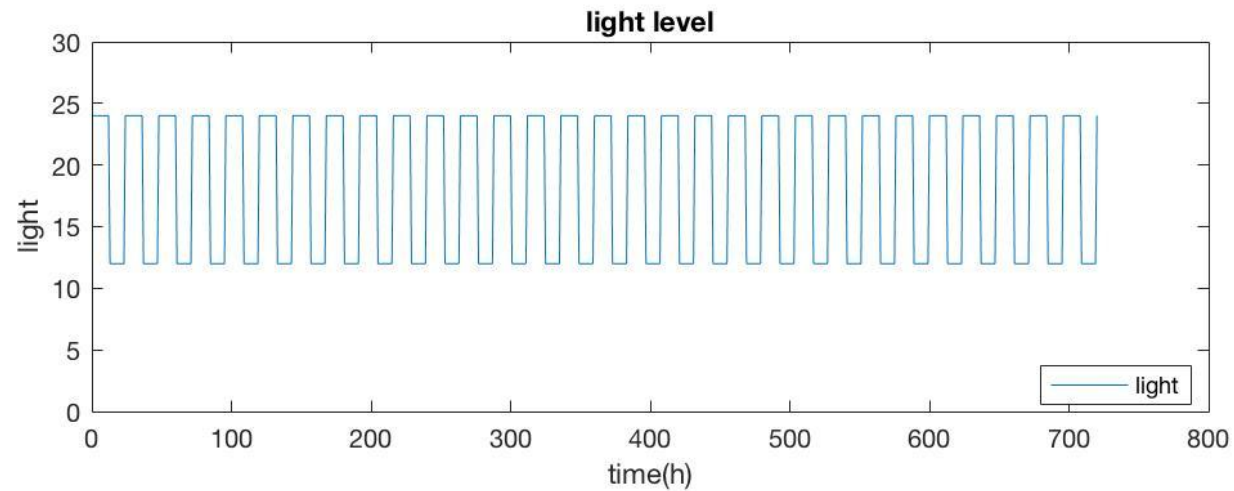
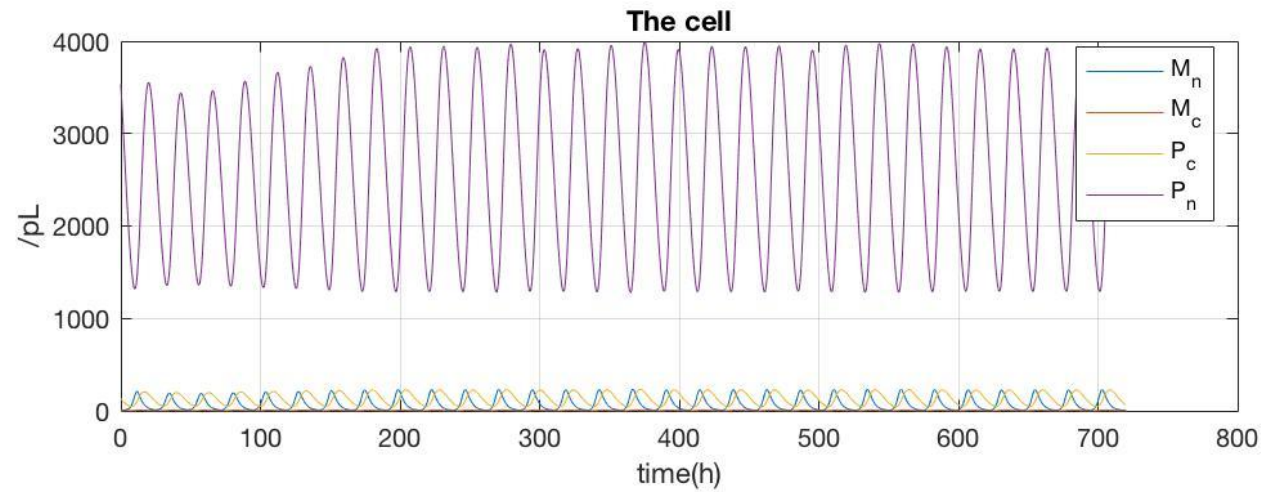
# The Experiment

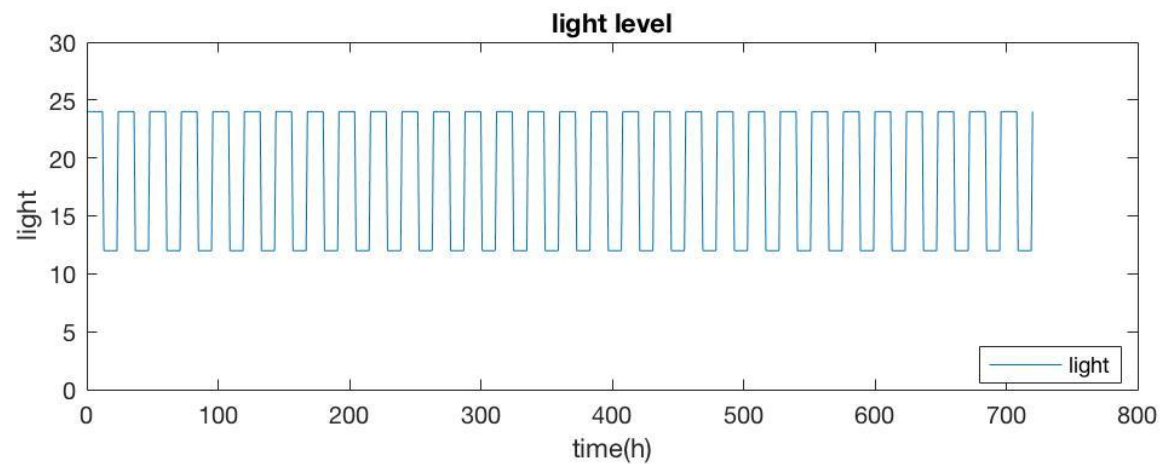
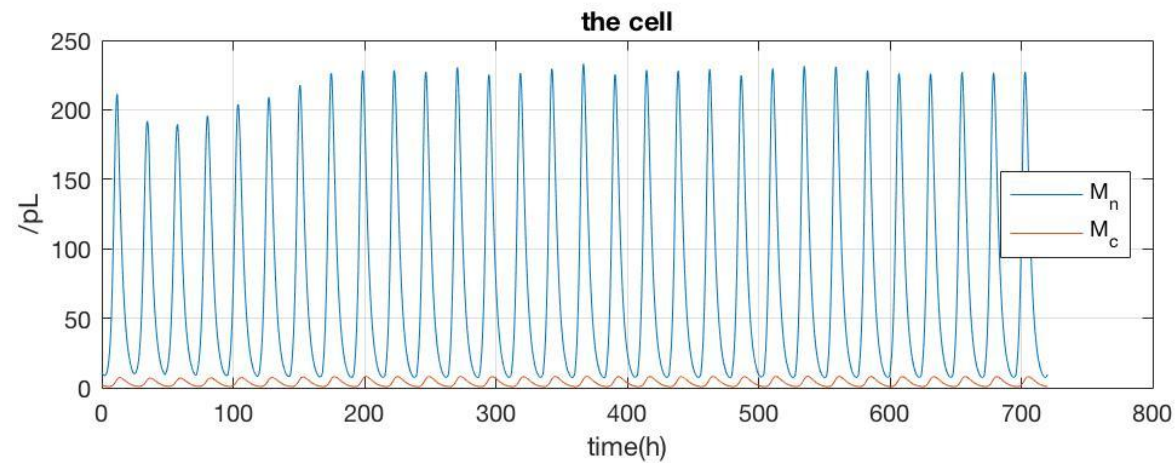
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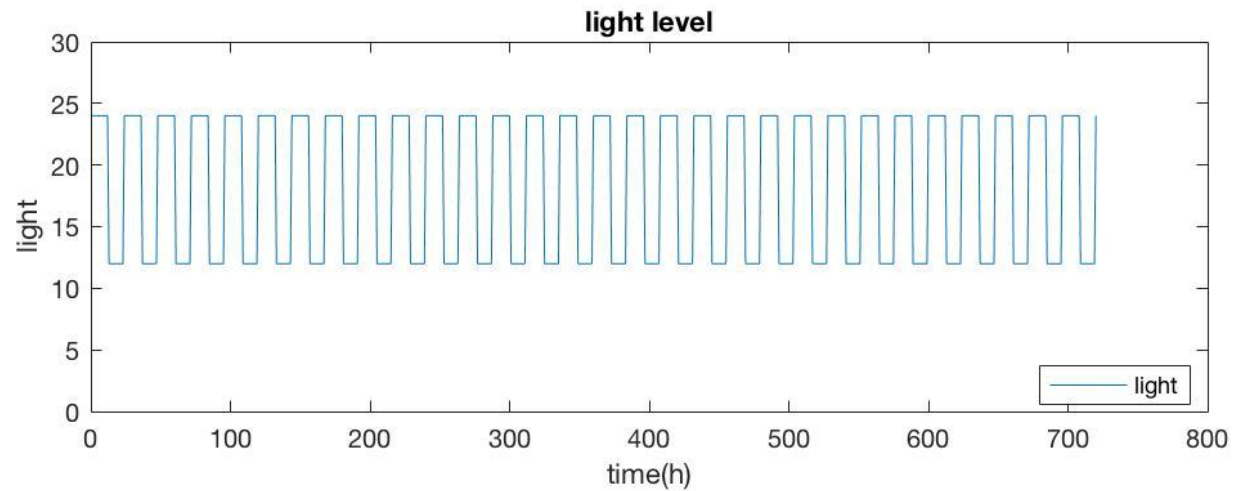
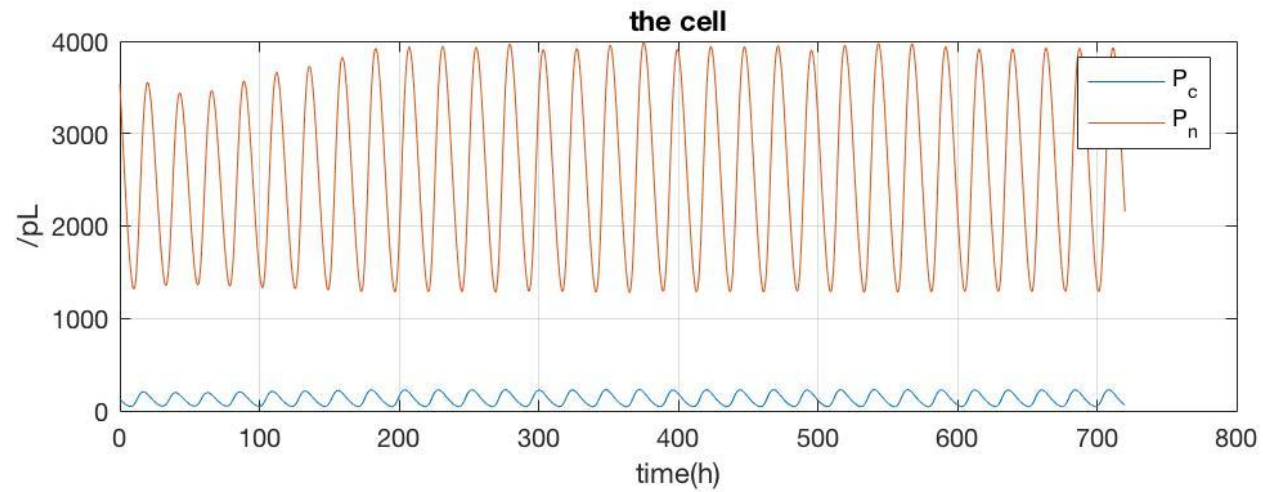
# Topics

- Entrainment by light
- Different light level functions
- Jet lag simulation

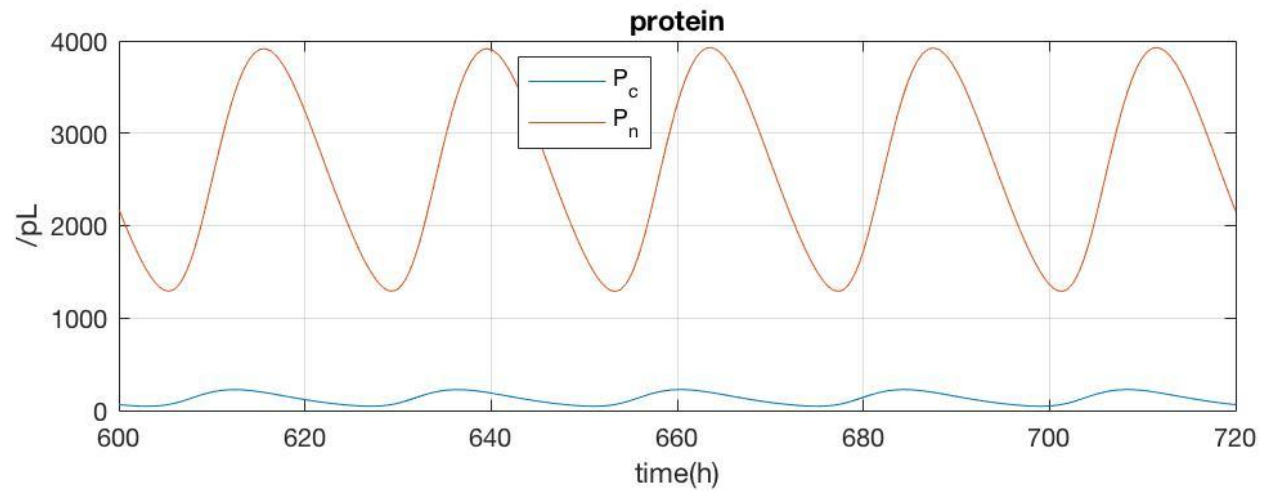
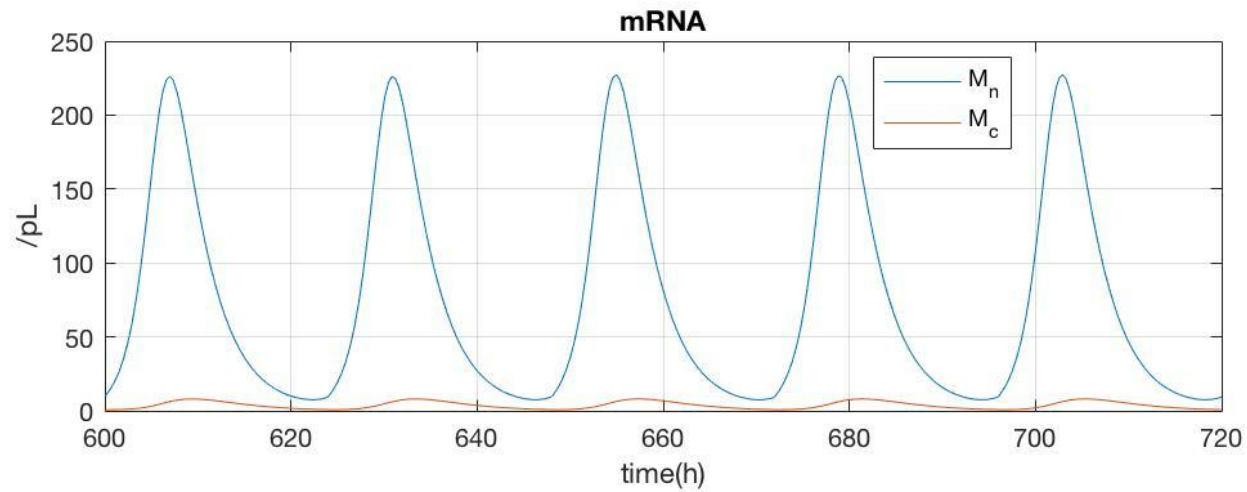
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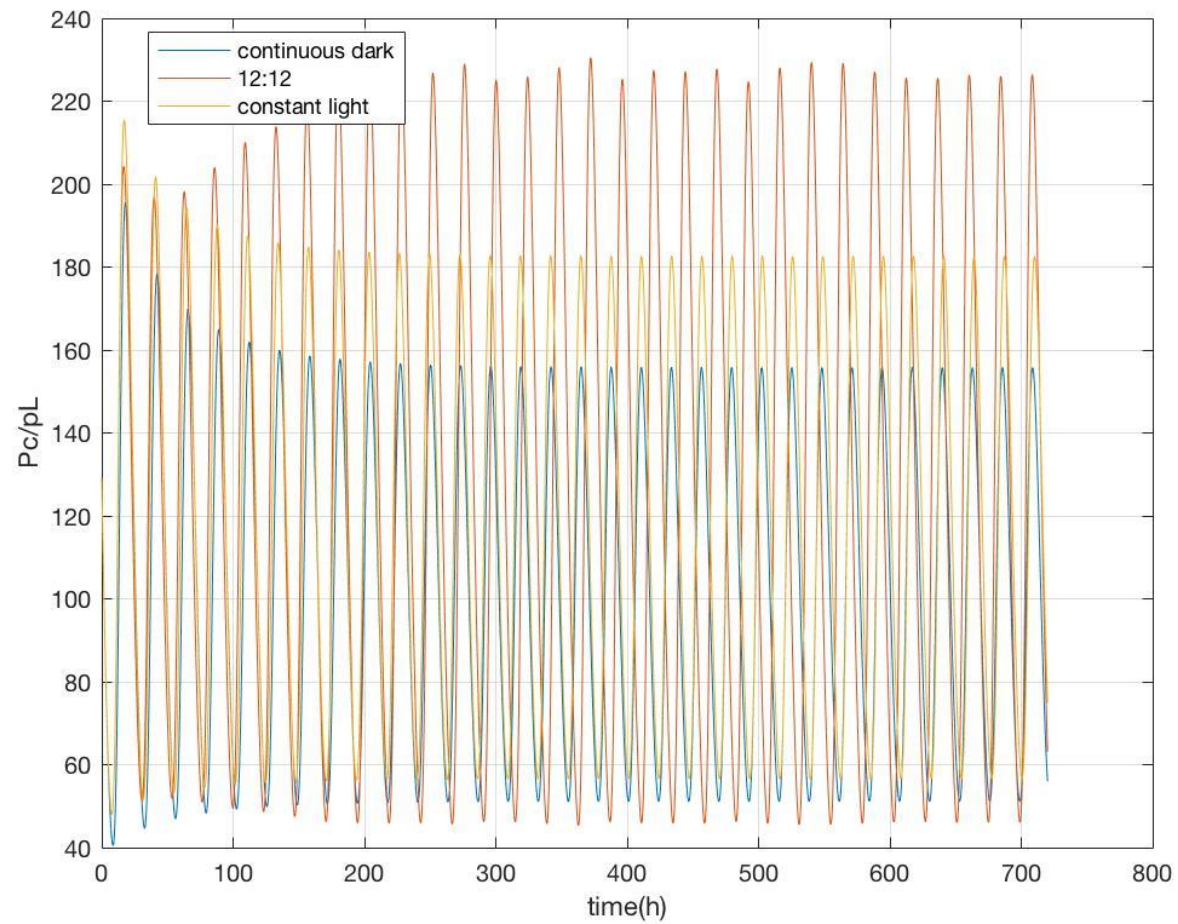


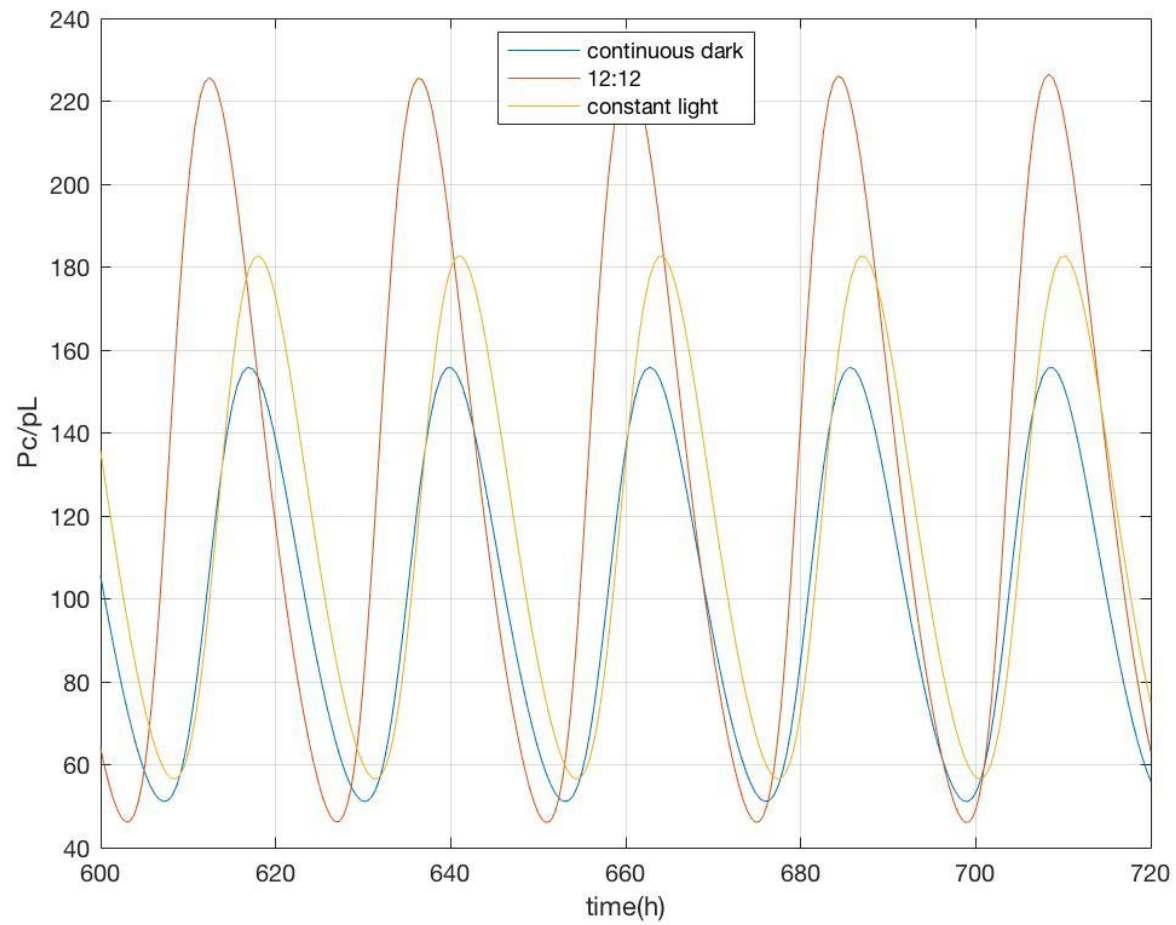




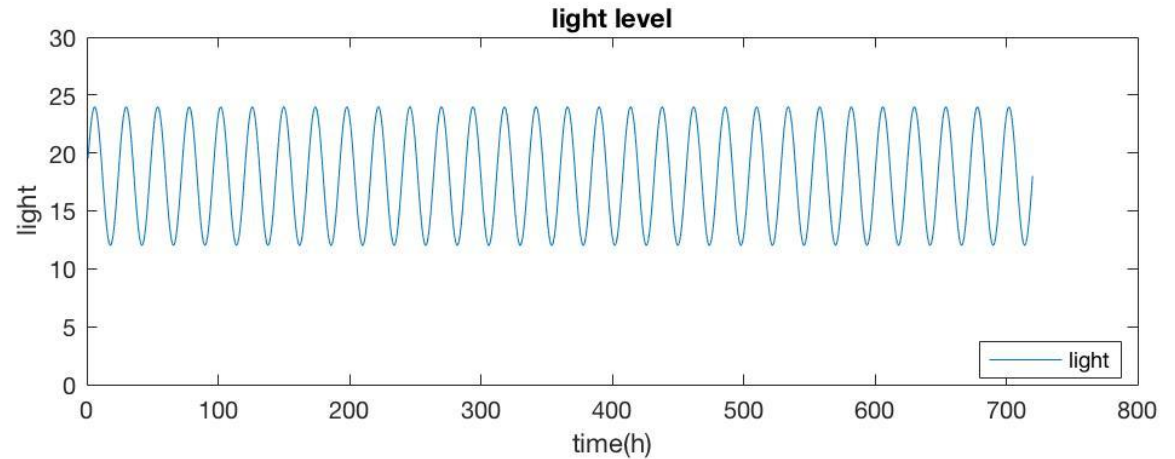
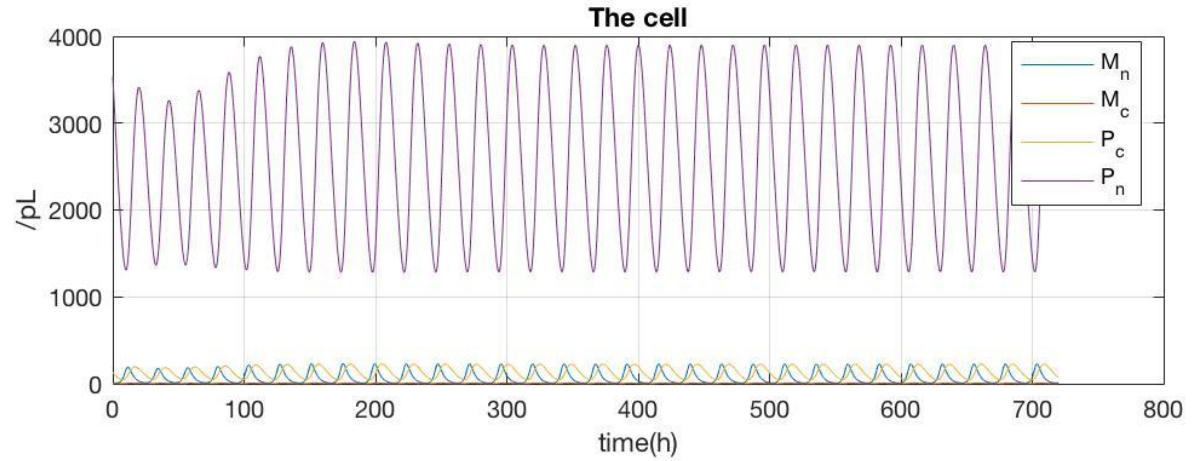




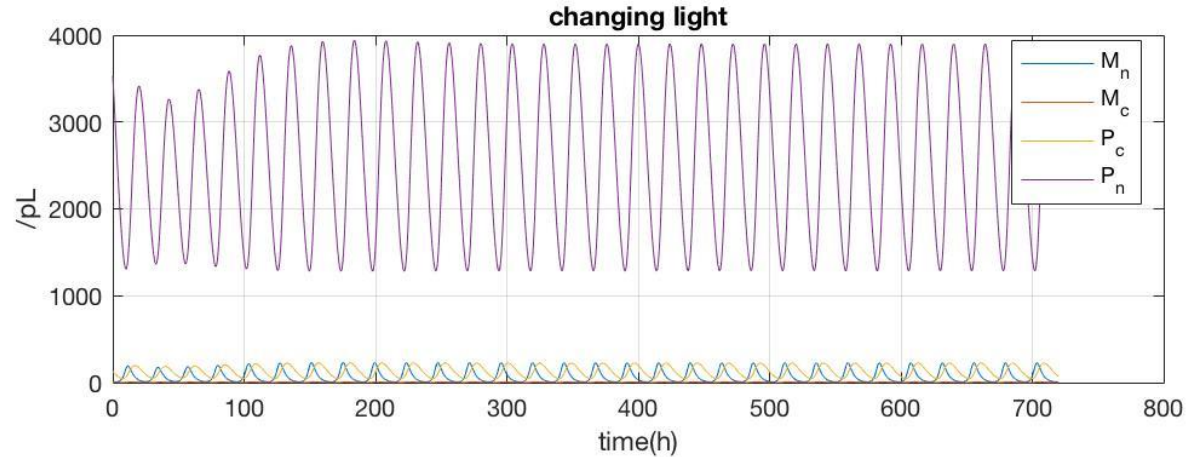
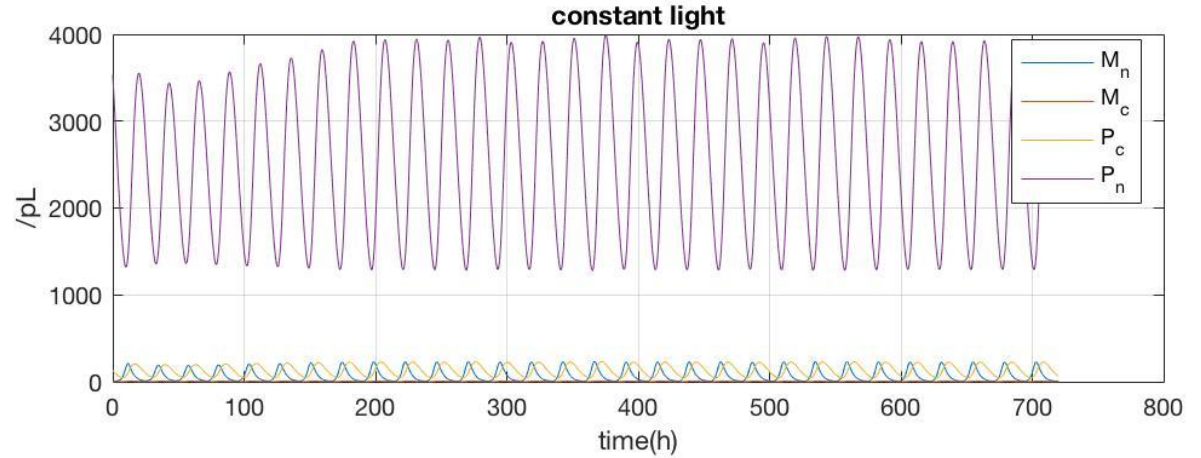


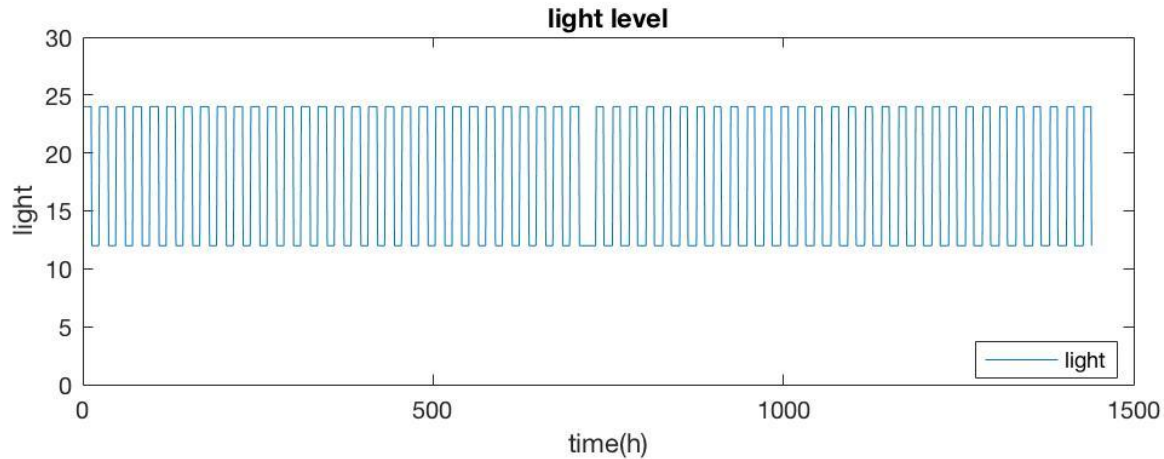
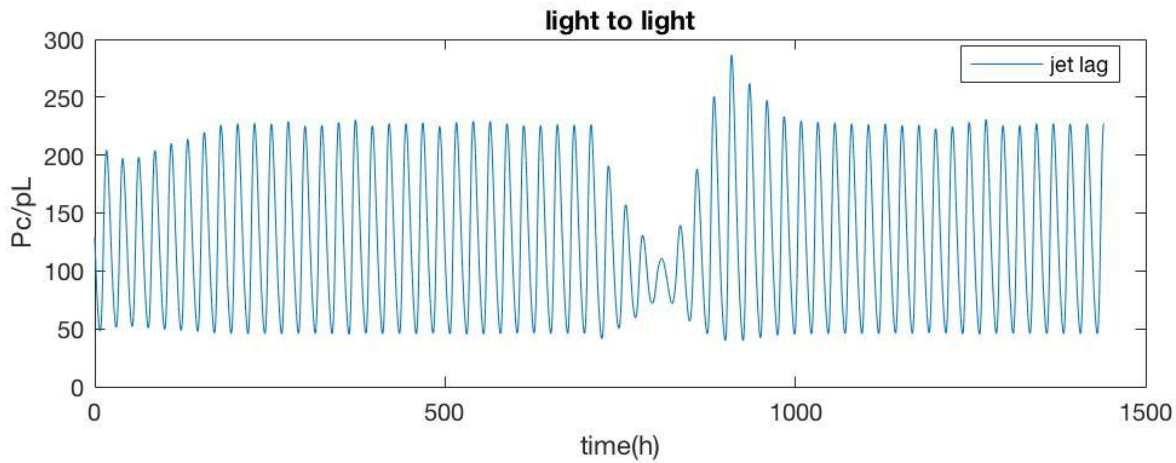


# Different light level function

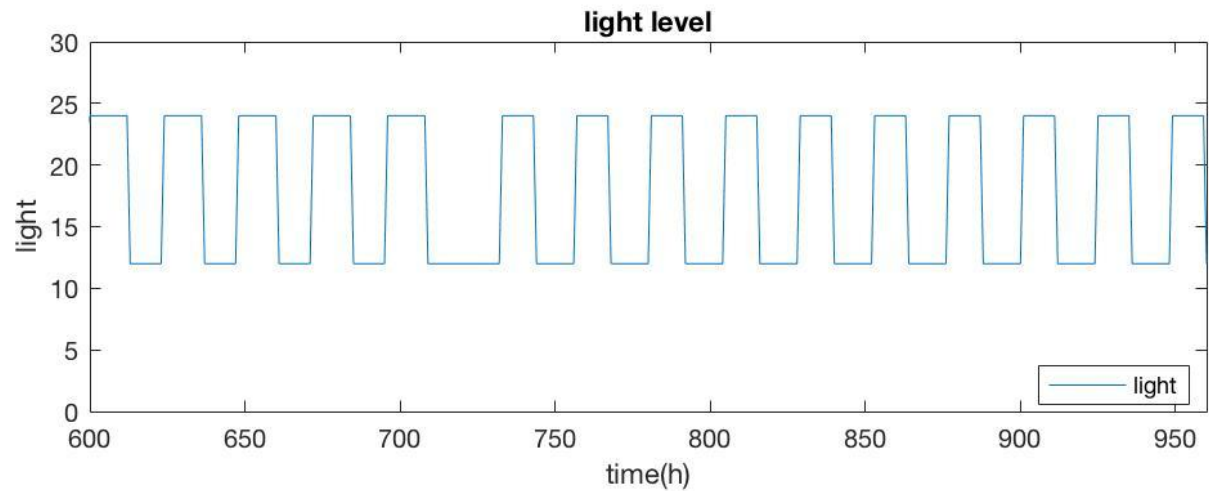
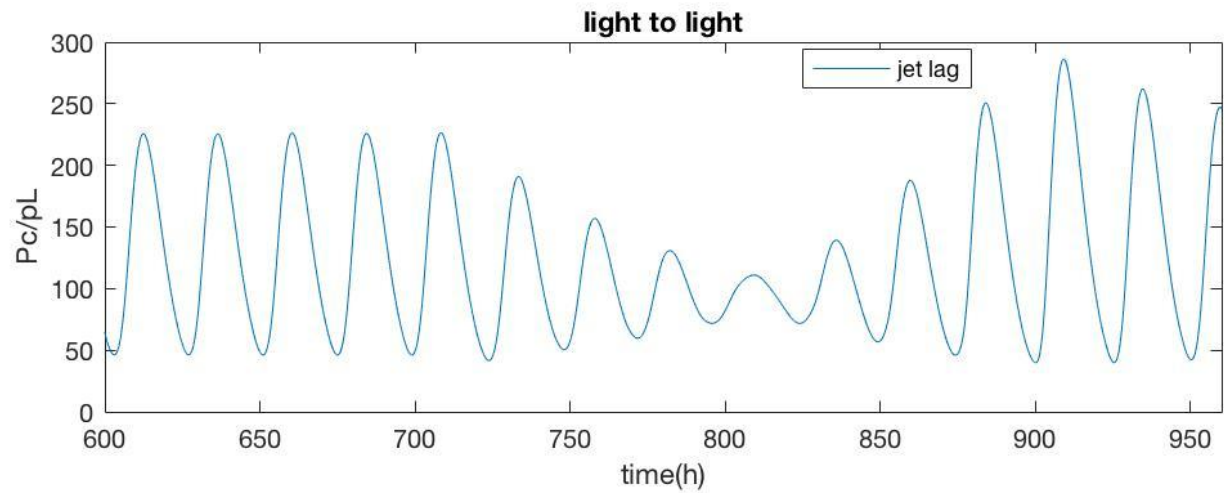


# Different light level function comparison



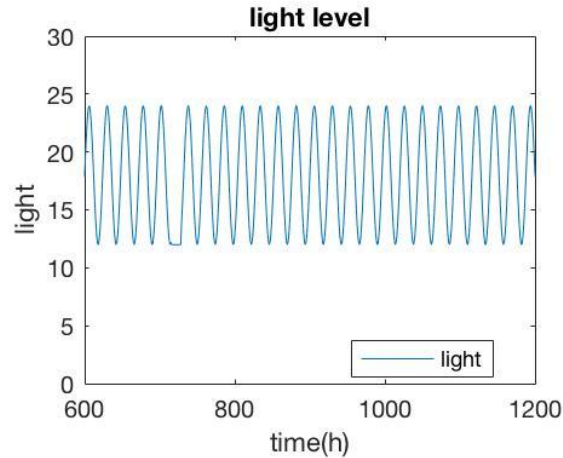
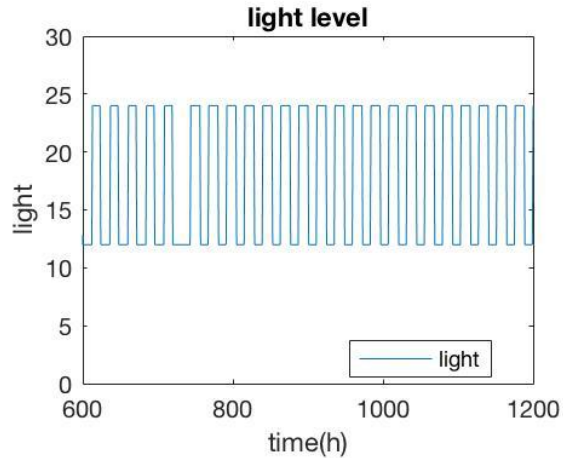
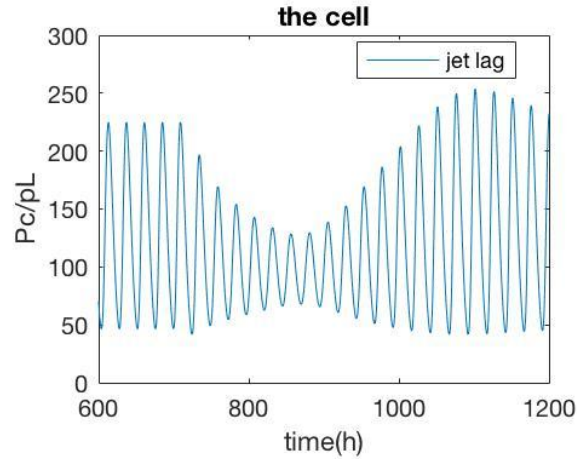
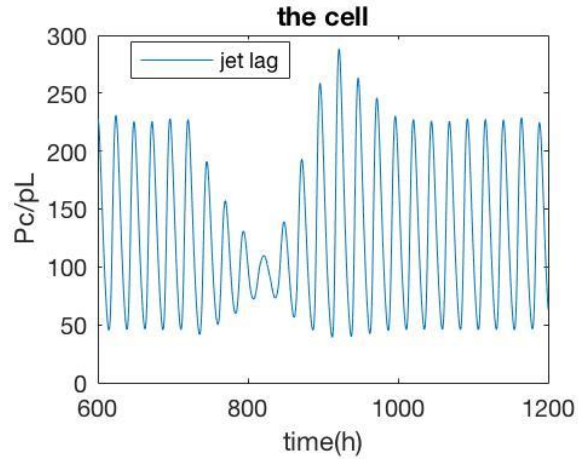


12 Hours  
Difference  
in the time  
zone

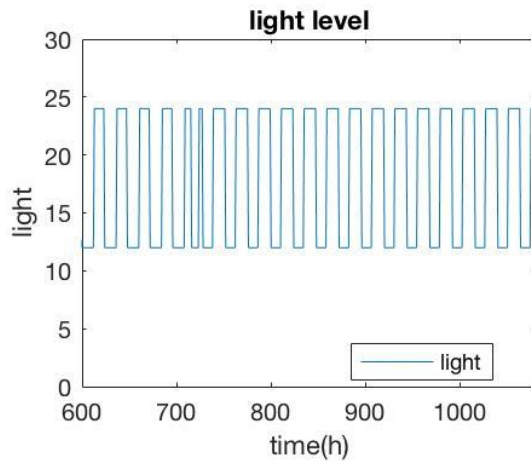
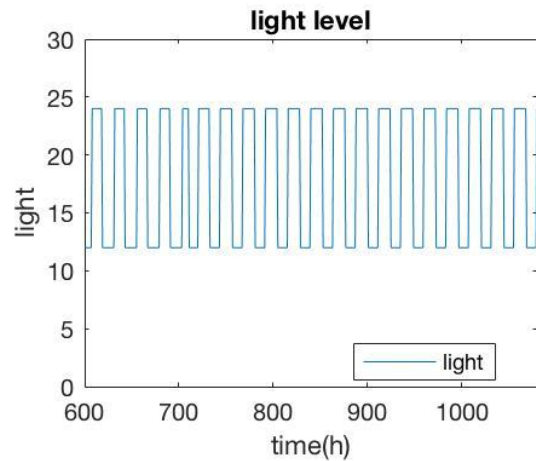
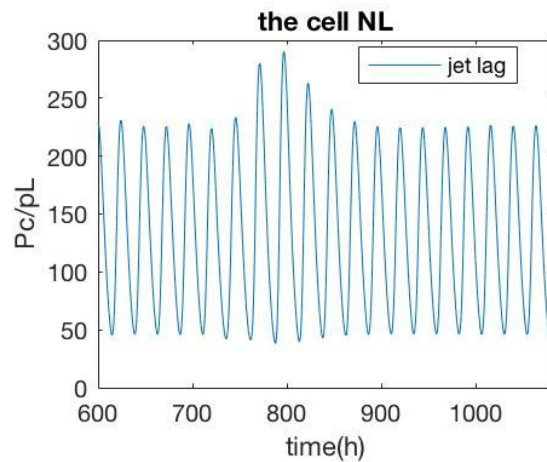
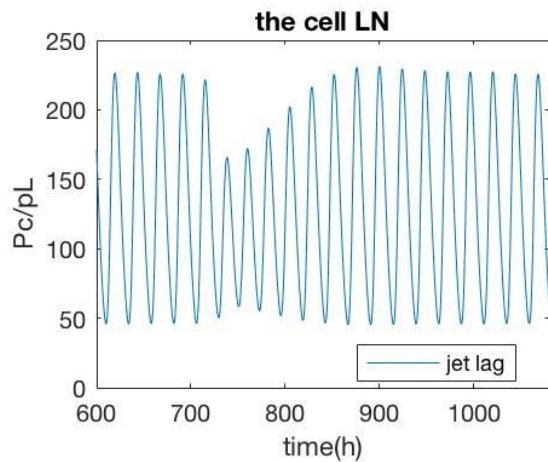




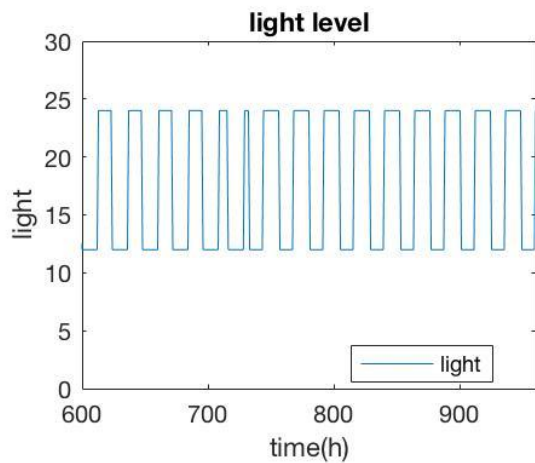
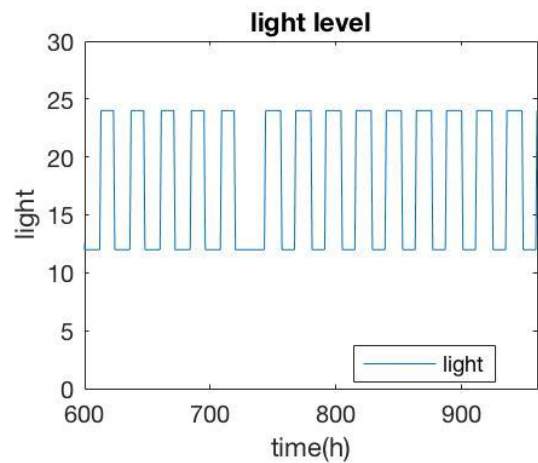
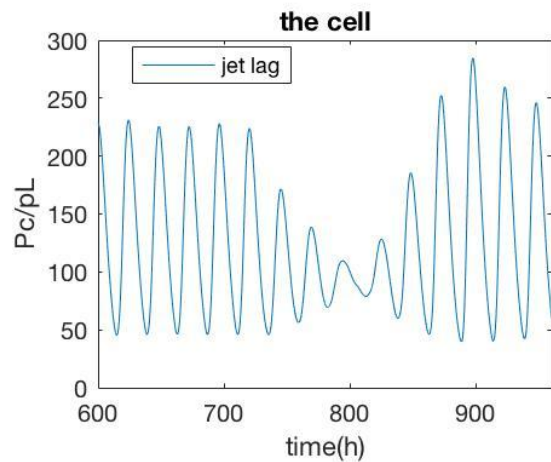
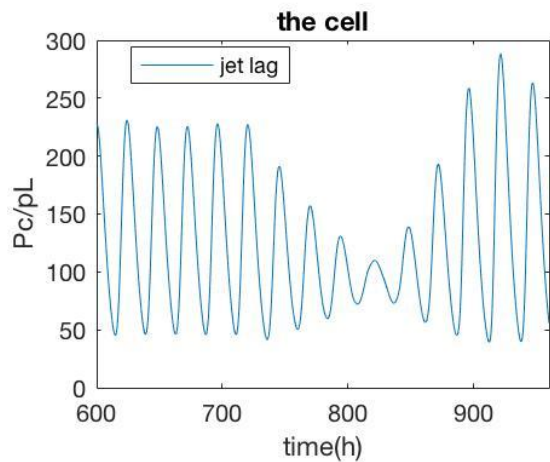
# Different light level function



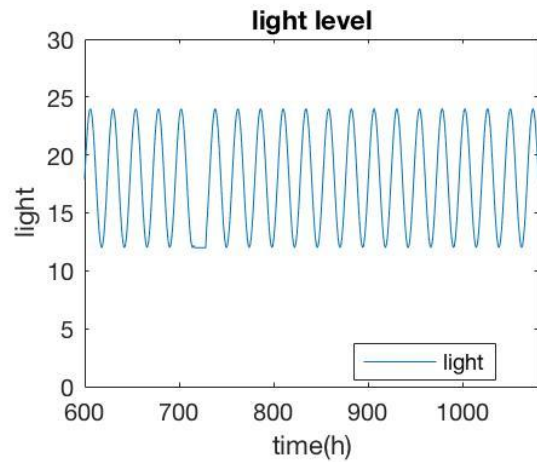
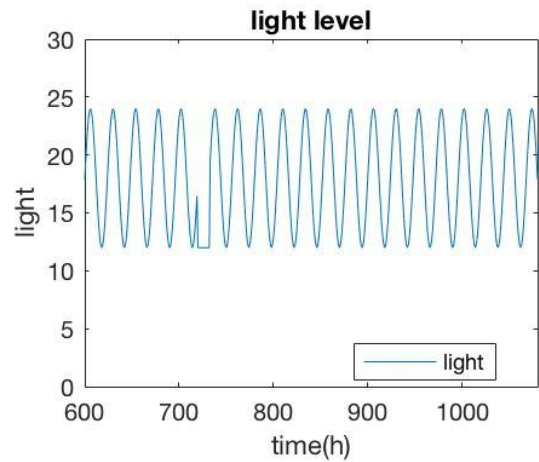
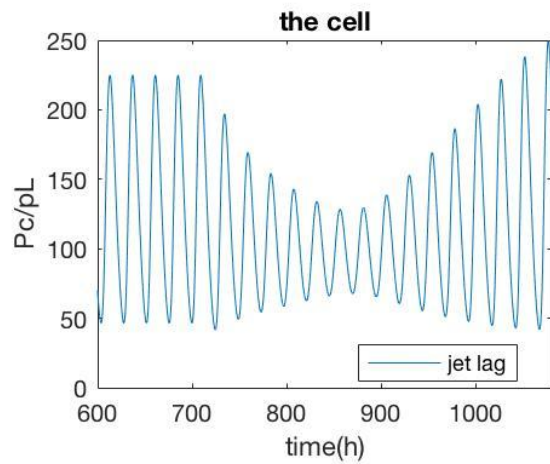
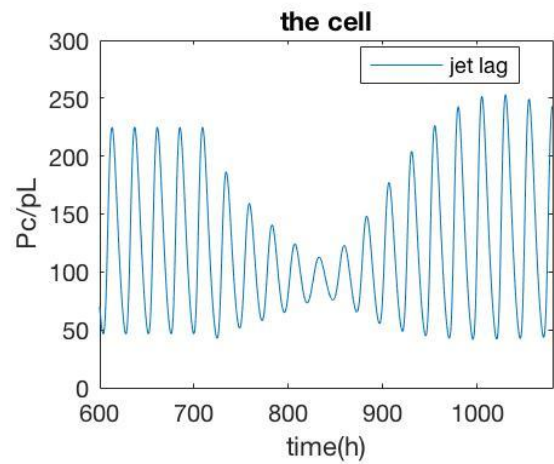


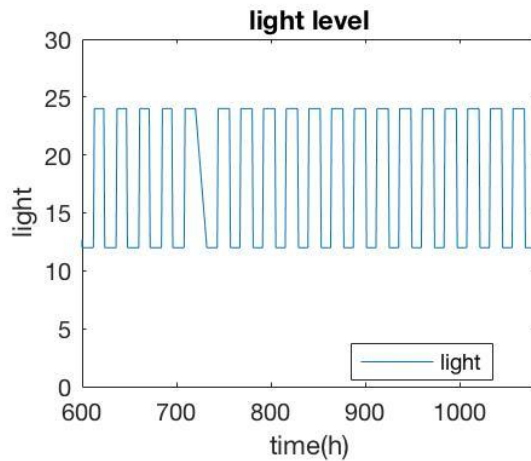
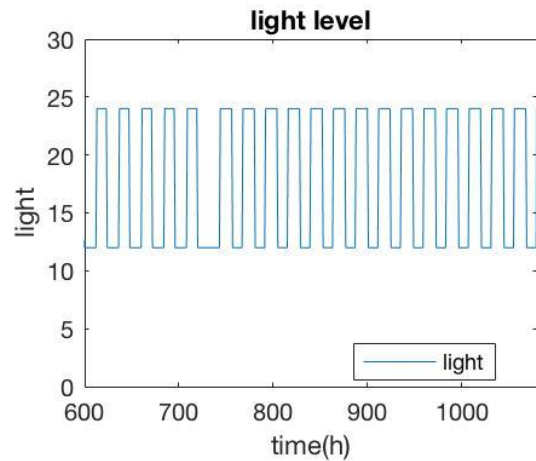
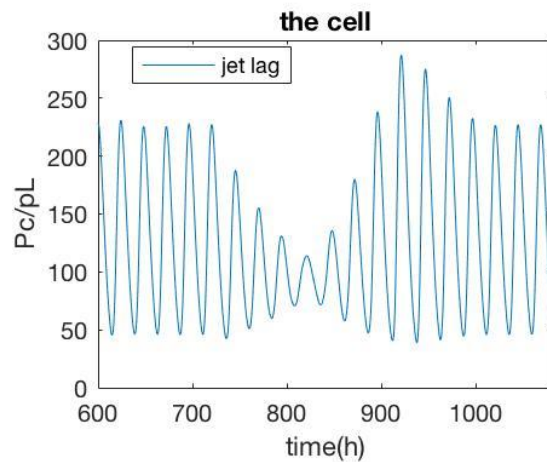
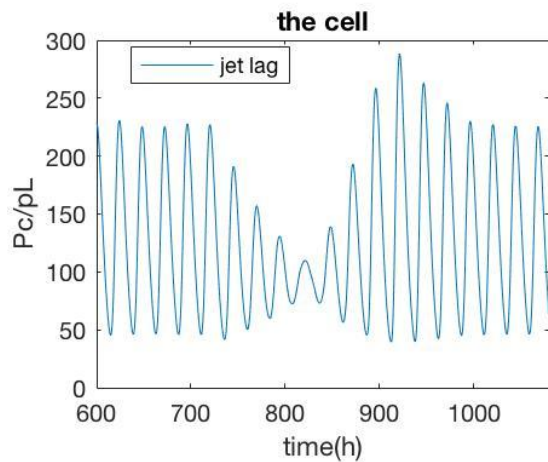


5 hour  
difference  
in the time  
zone

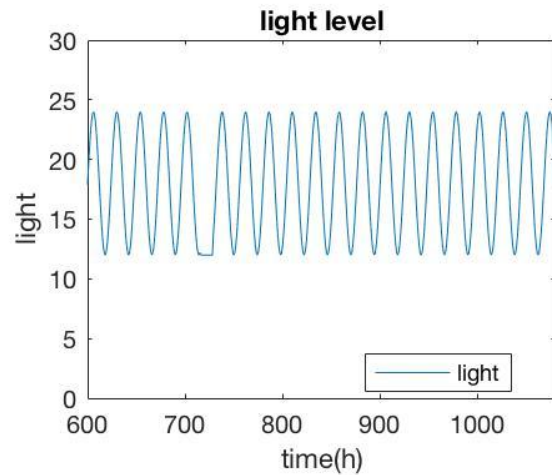
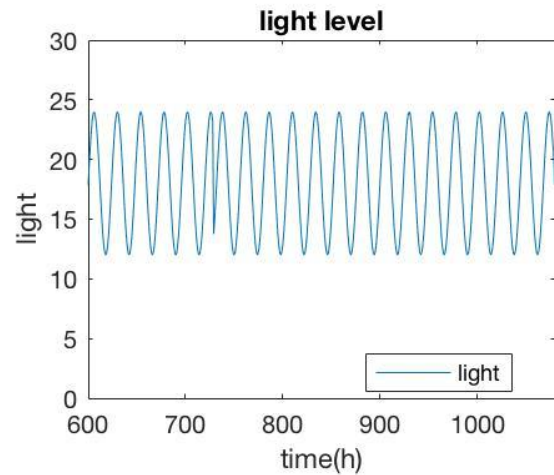
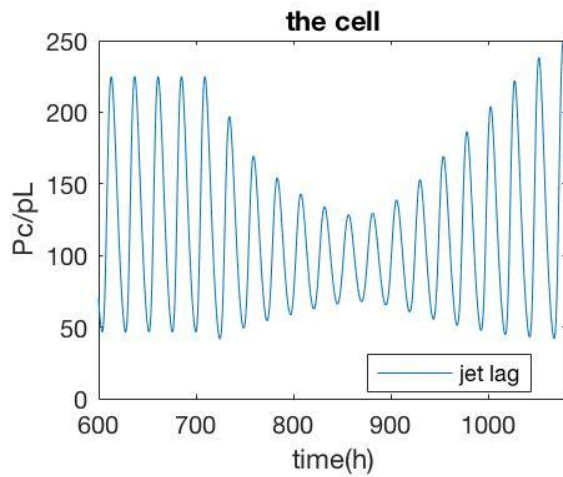
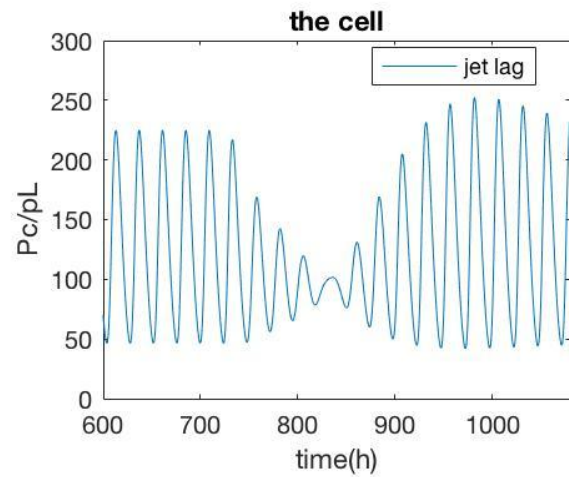


Different  
start time





During the  
flight



# Results

- To and back
- Start time
- Dark in the flight

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