

ActiPHV Manual

Installation

- (1) Install R (version 3.3.0) from: <https://www.r-project.org/>
 - a. If you already have R installed, but need to update the version, open R and type:
 - i. `install.packages("installr")`
 - ii. `library(installr)`
 - iii. `updateR()`
- (2) Install the required packages by typing:
 - i. `install.packages("ggplot2")`
 - ii. `install.packages("reshape2")`
 - iii. `install.packages("FKF")`
- b. Check for any error messages.

Preparation

- (1) Copy the R-scripts **ActiPHV.R** and **startActiPHV.R** to your desired location and get the path (*scriptPath*) to this location.
- (2) Open **startActiPHV.R** in your editor of choice
- (3) Edit the parameters:
 - a. `scriptPath` = see (1). Important note: Make sure you use the right slash ("/"). If you copy the path from Windows Explorer, you will have to change the backslashes ("\\") to slashes.
 - b. `d` = input directory. Should contain one file with tracking coordinates per filament (columns: Frame, x, y)
 - c. `o` = output directory. If it does not exist yet, it will be created. Important note: If you use the same output directory for different analyses, the results will be overwritten (not recommended). Please make sure not to create the output directory within the input directory.
 - d. `f` = frame rate in s/frame
 - e. `px` = pixel scale in $\mu\text{m}/\text{px}$
 - f. `l` = minimum phase length. All phases shorter than this will not be included into the results.

Start

- (1) Open R
- (2) Edit the parameters in **startActiPHVV.R**
- (3) Run **startActiPHVV.R**
- (4) The results will be in the directory you specified in the input parameters.

Results

- *veloOfMaxFraction.txt*: Summary for the maximum velocity result
- *phaseResults.txt*: All phase results with their corresponding filament IDs. For your analyses, the velocity/variance in $\mu\text{m}/\text{s}$ (columns: "veloMicromPerSec"/"var_veloMicromPerSec") will be the

most important to analyze. If you want, you can check the visual phase results for every filament ID in the plot in *PhaseIdentification.pdf*

- *PhaseIdentification2.pdf*: Phase identification results without filament ID labels.
- *DataForPlot.txt*: Data used for the *PhaseIdentification* plots. Can be used to reproduce any plots, if necessary.