STEERING DATA STATEMENT

This statement demonstrates the steps to run the steering algorithm for manipulating only a single levitated particle.

1. Open Micromanager with camera acquisition.
2. Open valve (run Switch\_P\_V.m).
3. Inject one particle manually.
4. Start the levitation frequency only (Arduino code must be uploaded to Arduino board).
5. Close Micromanager with camera acquisition.
6. Close valve (run Switch\_P\_V.m).
7. Run Steering Matlab code (steer\_DM.m or steer\_CFM.m).
8. Enter steering file number for saving steering data.
9. Click on the particle for measuring the vibration value (pop-up screen)
10. Specify shape steering (two points mainly, see instructions in Steering\_Shape\_Points.m) (pop-up screen)
11. Wait until manipulation finish (particle reach target and data for both steering stages are saved in the specified steering file)

* Run PLOT\_Steering\_Run.m for that steering file to display steering result for analysis (file number for DM is 983 and CFM is 1014).
* To run the steering statistics, SteeringStatistic.m generates the magnitude/direction error histograms as well as speed histogram.
* SuccessfulHistogram.m generates the DM\CFM Histogram of number of steps to a successful manipulation.
* Plot\_CFM and Plot\_DM are designed to plot the mentioned two steering examples.
* Two videos are attached for the two steering examples, these are generated by Matlab Codes VedioImages.m, similar for the square steering example.