# Description of Dataset

READ ME File For 'Dataset for "Mass transfer from small spheroids suspended in a turbulent fluid"'

Dataset DOI: 10.5258/SOTON/D1976

This dataset supports the publication:

Date of data collection: 14/12/2021

Licence: CC BY

Related projects: This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Sklodowska-Curie grant agreement No 846648. The authors acknowledge the use of the IRIDIS High Performance Computing Facility, and associated support services at the University of Southampton, in the completion of this work.

The accompanying files contains all necessary data and code to reproduce figures 1-8 from:

Lawson, J., & Ganapathisubramani, B. (2021). Mass transfer from small spheroids suspended in a turbulent fluid. Journal of Fluid Mechanics, 929, A19. doi:10.1017/jfm.2021.867

Nomenclature used is consistent with the manuscript.

Date that the file was created: 2021, December

|  |  |
| --- | --- |
| **Folder** | **Description** |
| data | MATLAB .mat (HDF5) files containing ensemble averaged single and two-time statistics of mass transfer rate obtained from simulations  |
| doc | Tabulated descriptions of the fields in the .mat files |
| dependencies | Third party MATLAB code necessary to create figures |
| . | MATLAB .m scripts to generate the relevant figures and provide an example of how to process the data in the associated .mat files |

|  |  |
| --- | --- |
| **File** | **Description** |
| alpha\_ARX.XX.mat | Contains tabulated values of parameters α and Sh0 (equation 4.4 and 4.5) for quasi-steady mass transfer model, as a function of strain topology s, angles θ and φ. Also contains mean Sherwood number, evaluated for Lagrangian timeseries of velocity gradient history, using different values of filter timescale τf |
| model\_correlation\_b0.96\_g0.33.mat | Contains joint statistics of simulated and modelled mass flux obtained from the quasi-steady mass transfer model |
| correlation\_4096\_lambda\_fX.XX.mat | Two-time and correlation statistics for mass transfer rate and local Peclet number, for different filter timescales τf |
| fluxstats\_4096.mat | Joint statistics of mass flux and local Peclet number/velocity gradient tensor |
| single\_and\_two\_time\_statistics.mat | Contains single and two-time statistics of average mass flux from simulation timeseries |