

Structure and content of the datasets

Structure

The datasets named as "dataset_massratio.hdf5" contain data for the entire parameter space (angle of periastron, orbital inclination and periastron distance) for a particular mass ratio. The datasets are available in the [hdf5](#) file format.

The tree structure can be viewed with the following command:

```
h5dump -A dataset_massratio.hdf5
```

The diagram below helps understand the structure of the datasets.

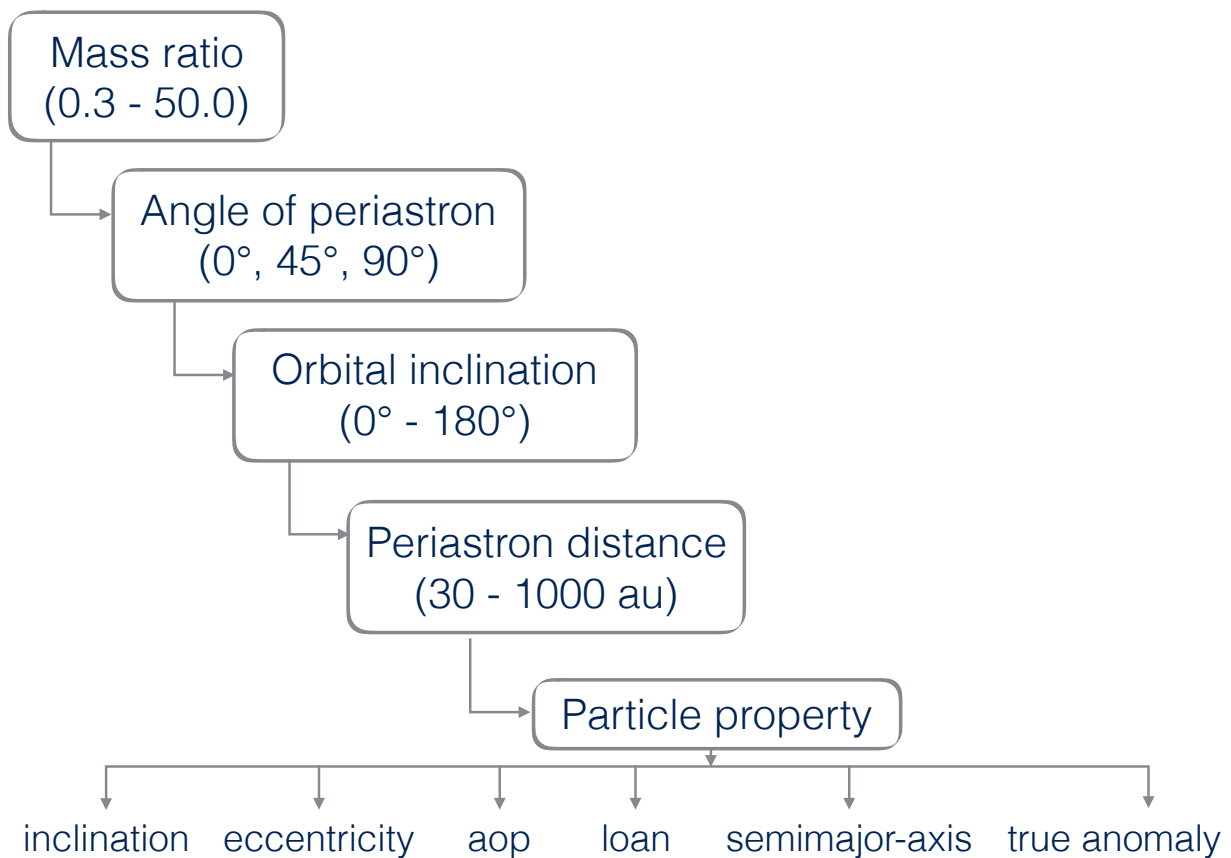


Figure 1: Here massratio is the main directory and the rest are subdirectories. Every main directory has three subdirectories which contain data for three different angle of periastra. Each of these three subdirectories again are divided into 19 different subdirectories for each orbital inclination. Each of the 19 different subdirectories then contain 12 different subdirectories for different periastron distances.

Content and nomenclature

For each encounter scenario, the following properties of only the particles that are "finally bound" to the host star can be accessed in the datasets.

- x, y, z positions: `x_position`, `y_position`, `z_position`
- inclination: `particle_inclination`
- eccentricity: `particle_eccentricity`
- semimajor axis: `particle_semimajoraxis`
- longitude of ascending node: `particle_loan`
- angle of periastron (or argument of periapsis): `particle_aop`
- true anomaly: `particle_true_anomaly`

Example

NOTE: The user would need to install the `h5py` python package in order to access the datasets.

If one wants to examine the particle inclinations after an encounter with mass ratio 1.0, aop 0° , orbital inclination 60° and periastron distance 100 au, use the following steps.

```
import numpy as np
import h5py
dataset = h5py.File("dataset_m0001.00000.hdf5", "r")
inclination = dataset["m0001.0000/w000/i060/p100/particle_inclination"]
inclination[:]
np.savetxt("particle_inclination.txt", inclination)
```

One can view or save any of the particle properties listed in the content section above. Be careful to use the correct file names as mentioned in the list.

Questions?

Drop an email: bhandare@mpia.de