GCfit

Globular Cluster Observation Data

Data File Catalog

Version 1

1 Introduction

in a hdf file..... etc

All supplementary error datasets can be either the symmetric dataset or two seperate down and up error datasets.

Everything should be within the given "key" group under the main file group. But if multiple "versions" of the datasets are to be used, then you can put everything under other groups under the key, which should be sorted out correctly under data.

But, this MUST be done for everything in that group, all parent groups of subgroups will not be read in data, so there can be no shared space for groups and datasets. All datasets must go under the lowest level of subgroup.

2 Attributes

key: `/initials`

All the parameters which are fit on
these values are the initial guesses
defaults are used if this isnt in the file, or any field is missing

Variable	Attribute Name	Description	Default Value
W_0	`W0`	Central potential	6.0
M	`M`	Total cluster mass [$10^6 M_\odot$]	0.69
r_h	`rh`	Half-mass radius [pc]	2.88
$\log(r_a)$	`ra`	Anisotropy radius [$\log(pc)$]	1.23
g	`g`	Truncation parameter	0.75
δ	`delta`		0.45
s^2	`s2`	Velocity scale nuisance parameter	0.1
F	`F`	Mass function nuisance parameter	0.45
a_1	`a1`	1st mass function power law exponent	0.5
a_2	`a2`	2nd mass function power law exponent	1.3
a_3	`a3`	3rd mass function power law exponent	2.5
BH_{ret}	`BHret`	Black hole initial retention fraction	0.5
d	`d`	Cluster distance [kpc]	6.405

3 Data Products

* denotes required fields

3.1 Pulsar Accelerations

key: `/pulsar`

3.1.1 Datasets

Variable	Dataset Name	Supplementary Datasets	attributes
Radial distance	r*		units
Spin period	P*	ΔP	units
Spin period derivative	Pdot_meas*	ΔPdot_meas*	units
Orbital period	Pb*	ΔPb	units
Orbital period derivative	Pbdot_meas*	ΔPbdot_meas*	units
Pulsar identifier	id		

Pulsars can be fit on the timing solutions of both the isolated pulsar spin (P, Pdot_meas) and the binary systems orbit (Pb, Pbdot). The period, derivative and corresponding errors are required for either.

3.1.2 Attributes

Attribute	Description
source	Literature source(s) of data
m	Mean stellar mass of tracer stars [$M_\odot$]

3.2 Number Density

key: /number_density

3.2.1 Datasets

Variable	Dataset Name	Supplementary Datasets	attributes
Radial distance	r*		units
Number Density	Σ^*	$\Delta\Sigma^*$	units

3.2.2 Attributes

Attribute	Description
source	Literature source(s) of data
m	Mean stellar mass of tracer stars [$M_\odot$]

3.3 Proper Motions

key: `/proper_motion`

3.3.1 Datasets

Variable	Dataset Name	Supplementary Datasets	attributes
Radial distance	`r`*	Δ`r`	`units`
Total proper motion	`PM_tot`*	Δ`PM_tot`*	`units`
Proper motion ratio	`PM_ratio`*	Δ`PM_ratio`*	`method`
Radial proper motion	`PM_R`*	Δ`PM_R`*	`units`
Tangential proper motion	`PM_T`*	Δ`PM_T`*	`units`

The proper motions can be fit on any of these components. The corresponding errors are required for any.

3.3.2 Attributes

Attribute	Description
`source`	Literature source(s) of data
`m`	Mean stellar mass of tracer stars [$M_\odot$]

3.4 Velocity Dispersions

key: `/velocity_dispersion`

3.4.1 Datasets

Variable	Dataset Name	Supplementary Datasets	attributes
Radial distance	`r`*		`units`
LOS velocity dispersion	σ*	$\Delta\sigma$*	`units`

3.4.2 Attributes

Attribute	Description
`source`	Literature source(s) of data
`m`	Mean stellar mass of tracer stars [$M_\odot$]

3.5 Mass Functions

key: `/mass_function`

3.5.1 Datasets

Variable	Dataset Name	Supplementary Datasets	attributes
Number of stars	`N`*		
Mass bin number	`bin`*		
Mass bin width	`mbin_width`*		`units` `method`
Mass bin mean	`mbin_mean`*		`units` `method`
Poisson measurement error	Δ`mbin`*		`method`
Mass bin left boundary	`mbin_left`		`units`
Mass bin right boundary	`mbin_right`		`units`

3.5.2 Attributes

Attribute	Description
`source`	Literature source(s) of data