GYRE Stellar Model (GSM) Format

GSM-format files store data describing a stellar model in an HDF5-format file. The attributes of the root group contain global stellar parameters, while 1-D datasets contained within the root group specify the structure data on a grid of n points extending from center to surface. These attributes and datasets are defined as follows:

Variable	Object name	(A)ttribute / (D)ataset	Object datatype	Definition
R_*	R_star	A	H5T_IEEE_F64LE	Stellar radius (cm)
M_*	M_star	A	H5T_IEEE_F64LE	Stellar mass (g)
L_*	L_star	A	H5T_IEEE_F64LE	Stellar luminosity ($\mathrm{erg\,s^{-1}}$)
n	n	A	H5T_STD_I64LE	Number of grid points
r	r	D	H5T_IEEE_F64LE	Radius (cm)
w	w	D	H5T_IEEE_F64LE	$M_r/(M_* - M_r)$
p	p	D	H5T_IEEE_F64LE	Total pressure ($\mathrm{dyn\,cm^{-2}}$)
T	T	D	H5T_IEEE_F64LE	Temperature (K)
ρ	rho	D	H5T_IEEE_F64LE	Density ($\mathrm{g\,cm^{-2}}$)
∇	nabla	D	H5T_IEEE_F64LE	$\mathrm{d}\ln T/\mathrm{d}\ln p$
N^2	N2	D	H5T_IEEE_F64LE	Brunt-Väisälä frequency squared ($\mathrm{s^{-2}}$)
Γ_1	Gamma_1	D	H5T_IEEE_F64LE	$(\partial \ln p/\partial \ln \rho)_{\mathrm{ad}}$
∇_{ad}	nabla	D	H5T_IEEE_F64LE	$(diff \ln T/\mathrm{d}\ln p)_{\mathrm{ad}}$
δ	delta	D	H5T_IEEE_F64LE	$-(\partial \ln \rho/\partial \ln T)_p$
ϵ	epsilon	D	H5T_IEEE_F64LE	energy generation rate ($\mathrm{erg}\,s^{-1}\,g^{-1}$)
ϵ_T	epsilon_T	D	H5T_IEEE_F64LE	$(\partial \ln \epsilon/\partial \ln T)_\rho$
ϵ_ρ	epsilon_rho	D	H5T_IEEE_F64LE	$(\partial \ln \epsilon/\partial \ln \rho)_T$
κ	kappa	D	H5T_IEEE_F64LE	opacity ($\mathrm{cm^2\,g^{-1}}$)
κ_T	kappa_T	D	H5T_IEEE_F64LE	$(\partial \ln \kappa/\partial \ln T)_\rho$
κ_ρ	kappa_rho	D	H5T_IEEE_F64LE	$(\partial \ln \kappa/\partial \ln \rho)_T$
Ω_{rot}	Omega_rot	D	H5T_IEEE_F64LE	Rotation angular velocity ($\mathrm{rad\,s^{-1}}$)