— HPDDM —

https://github.com/hpddm/hpddm

All keywords must be prefixed by `-hpddm_`. If a value is specified in the column "Default", this value is used when the corresponding option is not set by the user. When no default value is specified but the corresponding option is set by the user, the option is true (represented internally by 1). If the option is not set, its value is false (represented internally by 0). Options highlighted in red should be reserved to expert users.

Keyword	Description	Possible values	Default
help	Display available options	Anything	
version	Display information about HPDDM	Anything	
config_file	Load options from a file saved on disk	String	
tol	Relative decrease in residual norm to reach in order to stop iterative methods	Numeric	10^{-6}
max_it	Maximum number of iterations of iterative methods	Integer	100
verbosity	Level of output (higher means more displayed information)	Integer	
compute_residual	Print the residual after convergence	l2, l1, linfty	
reuse_preconditioner	Do not factorize again the local matrices when solving subsequent systems	Boolean	
local_operator_spd	Assume the local operator is symmetric positive definite	Boolean	
orthogonalization	Method used to orthogonalize a vector against an orthogonal basis	cgs, mgs	cgs
dump_matri(ces|x_[[:digit:]]+)	Save either one or all local matrices to disk	String	
dump_eigenvectors(_[[:digit:]]+)?	Save either one or all local eigenvectors to disk	String	
krylov_method	Type of iterative method used to solve linear systems	gmres, bgmres, cg, bcg, gcrodr, bgcrodr, bfbcg, richardson, none	gmres
enlarge_krylov_subspace	Split the initial right-hand side into multiple vectors	Integer	1
gmres_restart	Maximum number of Arnoldi vectors generated per cycle	Integer	40
variant	Left, right, or variable preconditioning	left, right, flexible	right
qr	Method used to perform distributed QR factorizations	cholqr, cgs, mgs	cholqr
deflation_tol	Tolerance when deflating right-hand sides inside block methods	Numeric	
recycle	Number of harmonic Ritz vectors to compute	Integer	
recycle_same_system	Assume the system is the same as the one for which Ritz vectors have been computed	Boolean	
recycle_strategy	Generalized eigenvalue problem to solve for recycling	A, B	A
recycle_target	Criterion to select harmonic Ritz vectors	SM, LM, SR, LR, SI, LI	SM
richardson_damping_factor	Damping factor using in Richardson iterations	Numeric	1.0
eigensolver_tol	Tolerance for computing eigenvectors by ARPACK or LAPACK	Numeric	10^{-6}
geneo_nu	Number of local eigenvectors to compute for adaptive methods	Integer	20
geneo_threshold	Threshold for selecting local eigenvectors for adaptive methods	Numeric	
geneo_estimate_nu	Estimate the number of eigenvalues below a threshold using the inertia of the stencil	Numeric	
geneo_force_uniformity	Ensure that the number of local eigenvectors is the same for all subdomains	min, max	
master_p	Number of master processes	Integer	1
master_distribution	Distribution of coarse right-hand sides and solution vectors	centralized, sol	centralized
master_topology	Distribution of the master processes	0, 1, 2	0
master_assembly_hierarchy	Hierarchy used for the assembly of the coarse operator	Integer	
master_aggregate_size	Number of master processes per MPI sub-communicators	Integer	master_p
master_dump_matrix	Save the coarse operator to disk	String	

master_exclude	Exclude the master processes from the domain decomposition	Boolean	
master_spd	Assume the coarse operator is symmetric positive definite	Boolean	

When using Schwarz methods, there are additional options.

Keyword	Description	Possible values	Default
schwarz_method	Type of Schwarz preconditioner used to solve linear systems	ras, oras, soras, asm, osm, none	ras
schwarz_coarse_correction	Type of coarse correction used in two-level methods	deflated, additive, balanced	

When using substructuring methods, there is an additional option.

Keyword	Description	Possible values	Default
substructuring_scaling	Scaling used in the definition of the Schur complement preconditioner	multiplicity, stiffness, coefficient	multiplicity

When using MKL PARDISO as a subdomain solver (resp. coarse operator solver), there are additional options, cf. https://software.intel.com/en-us/node/470298 (resp. https://software.intel.com/en-us/node/590089).

Keyword	Description	Possible values
mkl_pardiso_iparm_(2|8|1[013]|2[147])	Integer control parameters of MKL PARDISO for the subdomain solvers	Integer
master_mkl_pardiso_iparm_(2|1[013]|2[17])	Integer control parameters of MKL PARDISO for the coarse operator solver	Integer

When using MUMPS as a subdomain solver (resp. coarse operator solver), there are additional options, cf. http://mumps.enseeiht.fr/index.php?page=doc.

Keyword	Description	Possible values
mumps_icntl_([678]|1[234]|2[3789]|35)	Integer control parameters of MUMPS for the subdomain solvers	Integer
mumps_cntl_([123457])	Real control parameters of MUMPS for the subdomain solvers	Numeric
master_mumps_icntl_([678]|1[234]|2[3789]|35)	Integer control parameters of MUMPS for the coarse operator solver	Integer
master_mumps_cntl_([123457])	Real control parameters of MUMPS for the coarse operator solver	Numeric

When using *hypre* as a coarse operator solver, there are additional options, cf. http://acts.nersc.gov/hypre/#Documentation.

Keyword	Description	Possible values	Default
master_hypre_solver	Solver used by *hypre* to solve coarse linear systems	fgmres, pcg, amg	fgmres
master_hypre_tol	Relative convergence tolerance	Numeric	10^{-12}
master_hypre_max_it	Maximum number of iterations	Integer	500
master_hypre_gmres_restart	Maximum number of Arnoldi vectors generated per cycle when using FlexGMRES	Integer	100
master_boomeramg_num_sweeps	Number of sweeps	Integer	1
master_boomeramg_max_levels	Maximum number of multigrid levels	Integer	10
master_boomeramg_coarsen_type	Parallel coarsening algorithm	Integer	6
master_boomeramg_relax_type	Smoother	Integer	3
master_boomeramg_interp_type	Parallel interpolation operator	Integer	0

When using ARPACK as an eigensolver, there is an additional option.

Keyword	Description	Possible values
`arpack_ncv`	Number of Lanczos basis vectors generated in one iteration	Integer