

Table 1: Parameters in the runtime.txt file

Parameter	Type	Description
<b>density</b>	Double	kg/m3 - typically 2500 for sedimentary rocks
<b>spring_constant</b>	Double	units = N/m - The default value is 5544871985
<b>tangent_stiff</b>	Double	if we want a different tangential stiffness - default is 1.0
<b>damping_adaptor</b>	Double	a simple manner to adjust damping constant
<b>unit_length</b>	Double	unit diameter (i.e. a particle with radius 0.5) - m
<b>wall_elements</b>	Integer	number of lateral (side) wall elements
<b>base_elements</b>	Integer	number of base elements
<b>fault_elements</b>	Integer	number of fault elements
<b>total_run_time</b>	Double	maximum model run time - model seconds
<b>display_metres</b>	Double	increment with which to display results - m
<b>initial_equilibrate</b>	Flag (no = 0, yes = 1)	Initial equilibration of the assembly
<b>equil_time</b>	Double	total time for equilibration
<b>equi_nofrict</b>	Flag (no = 0, yes = 1)	with or without friction and bonding during the equilibration period
<b>output_forces</b>	Flag (no = 0, yes = 1)	an option to output model forces or not
<b>output_averageforces</b>	Flag (no = 0, yes = 1)	an option to output average forces or not
<b>high_res</b>	Flag (no = 0, yes = 1)	add sediments/generate media at "high resolution"
<b>very_high_res</b>	Flag (no = 0, yes = 1)	higher resolution still
<b>ultra_high_res</b>	Flag (no = 0, yes = 1)	even higher resolution model
<b>closetolimit 1</b>	Flag (no = 0, yes = 1)	have a higher max timestep
<b>num_layers_max</b>	Integer	layers in the assembly - will increase if there are growth strata
<b>define_spacing</b>	Flag (no = 0, yes = 1)	Define layer spacing
<b>default_spacing</b>	Double	Default layer spacing - m
<b>flexural_slip</b>	Flag (no = 0, yes = 1)	flexural slip - adjacent layers not initially bonded, and also no friction between them
<b>include_sedimentation</b>	Flag (no = 0, yes = 1)	include growth sedimentation in the model
<b>sed_metres</b>	Double	increment with which to add sediments - m
<b>static_baselevel</b>	Flag (no = 0, yes = 1)	static base level
<b>risefromruntime</b>	Flag (no = 0, yes = 1)	rise base level every time step
<b>baselevel_rise</b>	Double	base level rise per time step - m
<b>include_friction</b>	Flag (no = 0, yes = 1)	include Coulomb friction in calculations
<b>coeff_friction</b>	Double	micro or inter-particle friction
<b>base_coeff_friction</b>	Double	friction at base - allows a weak or strong decollement
<b>wall_coeff_friction</b>	Double	friction at lateral (side) walls - allows weak or strong walls
<b>fault_coeff_friction</b>	Double	friction at fault - allows a weak or strong fault
<b>c_0</b>	Double	intrinsic tangential cohesive shear force "c0" (N)
<b>first_slip</b>	Flag (no = 0, yes = 1)	0 = cohesion is lost only when elements separate, 1 = cohesion is lost after first slip event
<b>friction_layers</b>	Double	friction of variable layers
<b>frictionless_interfaces</b>	Flag (no = 0, yes = 1)	frictionless interfaces - typically every 4th or so - spaced
<b>layered_friction</b>	Flag (no = 0, yes = 1)	include an interlayered friction, i.e., mechanical stratigraphy
<b>frictionless_walls</b>	Flag (no = 0, yes = 1)	make the lateral (side) walls frictionless
<b>frictfree_rightendwall</b>	Flag (no = 0, yes = 1)	make the right lateral (side) wall frictionless
<b>frictionless_base</b>	Flag (no = 0, yes = 1)	make the base and fault plane frictionless
<b>frictionless_fault</b>	Flag (no = 0, yes = 1)	make only the fault plane frictionless
<b>include_variable_friction</b>	Flag (no = 0, yes = 1)	make variable layers of different friction = friction_layers
<b>include_variable_ductility</b>	Flag (no = 0, yes = 1)	make variable layers non-frictional and visco-elastic (salt)
<b>include_variable_viscosity</b>	Flag (no = 0, yes = 1)	make variable layers of different viscosity/damping
<b>var_viscosity_adaptor</b>	Double	viscosity/damping adaptor for variable layers, zero implies no damping in variable layers
<b>var_density_adaptor</b>	Double	density adaptor for variable layers/ zero means no density, 1 means input density
<b>varfrict_bottom</b>	Integer	start of variable layer -inclusive: layer at base of variable layers

Parameter	Type	Description
<b>varfrict_top</b>	Integer	end of variable layer -inclusive: layer at top of variable layers
<b>initial_bonding</b>	Flag (no = 0, yes = 1)	all bonds to be initially broken (0) or unbroken (1)
<b>homog_bonding</b>	Flag (no = 0, yes = 1)	make bonding/cohesion (breaking strain) homogeneous
<b>percent_broken</b>	Flag (no = 0, yes = 1)	make an initial percentage of identified bonds broken
<b>breakpercentage</b>	Double	percentage of bonds initially broken
<b>internal_bst</b>	Double	breaking strain between internal elements
<b>wall_bst</b>	Double	breaking strain for wall elements
<b>basal_bst</b>	Double	breaking strain for base elements
<b>fault_bst</b>	Double	breaking strain for fault elements
<b>walls_bonded</b>	Flag (no = 0, yes = 1)	lateral (side) walls are welded/bonded to start with
<b>free_rightendwall</b>	Flag (no = 0, yes = 1)	lateral (side) right wall is welded/bonded to start with
<b>base_bonded</b>	Flag (no = 0, yes = 1)	base is welded/bonded to start with
<b>faults_bonded</b>	Flag (no = 0, yes = 1)	fault is welded/bonded to start with
<b>displacement_sign</b>	Double	the sign of the displacement, +ve is to right or upward, -ve to left or downward
<b>regional_stretch</b>	Flag (no = 0, yes = 1)	regional stretch mode test - only applicable in extension. basically this is a sort of constant heave
<b>faultdipdegrees</b>	Double	dip of a fault (in degrees)
<b>fault_xloc</b>	Double	location of 1st fault in unit lengths
<b>fault_offset</b>	Double	offset of second fault in unit lengths
<b>fault_sculpt</b>	Flag (no = 0, yes = 1)	effectively sculpt a footwall block as a lefthand (wall) boundary
<b>max_fault_dip</b>	Double	final upper limit of fault dip in degrees
<b>irregular_fault</b>	Flag (no = 0, yes = 1)	irregular fault read in from disk
<b>mylar_sheet</b>	Flag (no = 0, yes = 1)	include a mylar sheet that is attached to the right-hand wall or variants
<b>include_inversion</b>	Flag (no = 0, yes = 1)	include a phase of inversion
<b>start_inversion</b>	Double	fraction of runtime/timesteps at which inversion starts
<b>caldera_piston</b>	Flag (no = 0, yes = 1)	piston-like caldera subsidence/uplift
<b>keystone_faults</b>	Flag (no = 0, yes = 1)	keystone block test - only applicable in extension
<b>include_erosion</b>	Flag (no = 0, yes = 1)	include erosion above a defined baselevel
<b>sudden_tilt</b>	Flag (no = 0, yes = 1)	sudden tilt of the model after equilibration
<b>tilt_angle</b>	Double	tilt angle in degrees
<b>open_tilted_wall</b>	Flag (no = 0, yes = 1)	lateral (side) right wall is removed after equilibration (collapse)
<b>both_walls</b>	Flag (no = 0, yes = 1)	make both walls act at the same time - works for compression, extension, or collapse
<b>lateral_push_fromright</b>	Flag (no = 0, yes = 1)	include simple horizontal contraction or extension - mobile right wall
<b>lateral_push_fromleft</b>	Flag (no = 0, yes = 1)	include simple horizontal contraction or extension - mobile left wall
<b>unibiax_test</b>	Flag (no = 0, yes = 1)	uniaxial or biaxial test option
<b>confining_pressure</b>	Double	confining pressure applied to walls in uni/biax test or overburden
<b>infdef_body</b>	Flag (no = 0, yes = 1)	activate code for simulating an inflating or deflating body
<b>cavity_body</b>	Flag (no = 0, yes = 1)	the body is actually a cavity, or a hemispherical crater
<b>spherical_body</b>	Flag (no = 0, yes = 1)	spherical inflating or deflating body - if not spherical it is, by default, a rectangle
<b>elliptical_body</b>	Flag (no = 0, yes = 1)	elliptical inflating or deflating body - it is a sub-type of the spherical body
<b>slot_dip</b>	Double	dip in degrees of the trailing sheet in either slotwedge configuration
<b>include_slot1</b>	Flag (no = 0, yes = 1)	include horizontal extension via a slot-discontinuity
<b>include_slot2</b>	Flag (no = 0, yes = 1)	include horizontal sliding against a fixed end wall with a slot-discontinuity
<b>include_basalstretch</b>	Flag (no = 0, yes = 1)	include horizontal basal stretching across a defined zone
<b>overburden</b>	Flag (no = 0, yes = 1)	apply a top pressure to simulate overburden - pressure = confining_pressure
<b>mechstratlayers</b>	Integer	number of layers for mechanical stratigraphy, for this to work layered_friction should be 1
<b>layer#start</b>	Integer	base layer for mechanical layer
<b>layer#finish</b>	Integer	top layer for mechanical layer; repeat these last two for as many mechstratlayers you have