

Example documentation

Node types

	Declaration
	Definition
	Declaration / Modification
	Definition / Modification
	Modification

Node reference

Property name	#	#	#	#	#
box.geometry		1			
box.size.vy		1			
box.size.x	1				1
box.size.y	1	1		1	
box.size.z		1			
cells.densities		1			
cells.sizes		1			
cells.temperatures		1			
cfl_factor		1			
max_vare		1			
max_vari		1			
modules.heating	1				1
modules.hydrodynamics		1			
modules.radiation	1				1
runtime.t_max	1				1
runtime.timestep	1				1
simulation.name		1			
simulation.precision		1			

Node list

box.geometry

PDF_FILE1:19		uint16
Value:	3	
Options:	1, 2, 3	
Description:	Type of grid geometry	

box.size.vy

PDF_FILE1:37		float64
Value:	23.000	
Default Unit:	km/s	

box.size.x

PDF_FILE1:26		float128
Default Unit:	cm	
Condition:	{?} > 0	
Description:	Box size in X direction	
settings:8		mod
Value:	10	
Default Unit:	nm	

box.size.y

PDF_FILE1:31		float64
Default Unit:	cm	
Options:	3.0 cm, 4.0 cm	
Description:	Box size in Y direction	
PDF_FILE1:36		float64
Value:	34.000	
Default Unit:	au	
settings:9		mod
Value:	3e7	
Default Unit:	nm	

box.size.z

PDF_FILE1:42		constant float64
Value:	23.000	
Default Unit:	cm	
Options:	10.0 m, 20.0 cm, 23.0 cm, 26.0 cm	
Description:	Box size in Z direction	

cells.densities

cells:1		float64
Value:	[0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0]	
Default Unit:	km/s	

cells.sizes

cells:2		int32
Value:	[10, 11, 12, 13, 14, 15, 16, 17, 18, 19]	
Default Unit:	cm	

cells.temperatures

cells:3		float64
Value:	[20.0, 21.0, 22.0, 23.0, 24.0, 25.0, 26.0, 27.0, 28.0, 29.0]	
Default Unit:	K	

cfl_factor

PDF_STRING1:4		float64
Value:	0.700	

max_vare

PDF_STRING1:5		float64
Value:	0.200	

max_vari

PDF_STRING1:6		float64
Value:	0.200	

modules.heating

PDF_FILE1:54		bool
Tags:	preprocessor	
Description:	Switch on heating module	
settings:12		mod
Value:	false	

modules.hydrodynamics

PDF_FILE1:51		bool
Value:	true	
Tags:	preprocessor	
Description:	Switch on hydrodynamics module	

modules.radiation

PDF_FILE1:57		bool
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Tags:	preprocessor
Description:	Switch on radiation module
settings:13 mod	
Value:	true

runtime.t_max

PDF_FILE1:10 float64	
Default Unit:	s
Condition:	{?} > 0
Description:	Maximum simulation time
settings:2 mod	
Value:	10
Default Unit:	ns

runtime.timestep

PDF_FILE1:13 float64	
Default Unit:	s
Condition:	{?} < {?runtime.t_max} && {?} > 0
Description:	Simulation time step
settings:3 mod	
Value:	0.01
Default Unit:	ns

simulation.name

PDF_FILE1:4 str	
Value:	simulation
Format:	[a-zA-Z_-]+

simulation.precision

PDF_FILE1:6 str	
Value:	double
Options:	double, float

Custom units

Name	Value	Units	Source
[velocity]	13	cm/s	PDF_ROOT:27
[length]	1	cm	PDF_STRING1:1
[mass]	2	g	PDF_STRING1:2

Sources

PDF_ROOT

File: build_docs.py

PDF_STRING1

File: build_docs.py

Source: [PDF_ROOT:28](#)

```
1      $unit length = 1 cm
2      $unit mass = 2 g
3
4      cfl_factor float = 0.7 # Courant-Friedrichs-Lewy condition
5      max_vare float = 0.2  # maximum energy change of electrons
6      max_vari float = 0.2  # maximum energy change of ions
```

PDF_FILE1

File: definitions.dip

Source: [PDF_ROOT:37](#)

```
1  $source settings = settings.dip
2
3  simulation
4    name str = "simulation"
5    !format "[a-zA-Z_-]+"
6    precision str = "double"
7    !options ["double","float"]
8
9  runtime
10   t_max float s # mandatory
11   !condition ("{?} > 0")
12   !description "Maximum simulation time"
13   timestep float s
14   !condition ("{?} < {?runtime.t_max} && {?} > 0") # mandatory
15   !description "Simulation time step"
16   {settings?runtime.*}
17
18  box
19   geometry uint16 = {settings?box.geometry} # mandatory
20   = 1 # linear
21   = 2 # cylindrical
22   = 3 # spherical
23   !description "Type of grid geometry"
24
25  size
26   x float128 cm # mandatory
27   !condition ("{?} > 0")
28   !description "Box size in X direction"
29   #y float cm # first declared here
30   @case ("{?box.geometry} == 2")
31     y float cm # mandatory if geometry is non-linear
32     = 3 cm
33     = 4 cm
34     !description "Box size in Y direction"
35   @case ("{?box.geometry} == 3")
36     y float = 34 au
37     vy float = 23 km/s
38   #@else
39   # y float = 3 m
40   @end
41   @case ("{?box.geometry} == 3")
42     z float = 23 cm # constant
43     = 10 m
44     !options [20,23,26] cm
45     !description "Box size in Z direction"
46     !constant
47   @end
```

```

48     {settings?box.size.*}
49
50 modules
51     hydrodynamics bool = true # optional
52     !description "Switch on hydrodynamics module"
53     !tags ["preprocessor"]
54     heating bool # mandatory
55     !description "Switch on heating module"
56     !tags ["preprocessor"]
57     radiation bool # mandatory
58     !description "Switch on radiation module"
59     !tags ["preprocessor"]
60
61     {settings?modules.*}
62
63 cells
64     {cells?*}

```

cells	
File:	cells.dip
Source:	PDF_ROOT:36

```

1 densities float[10] = [0,1,2,3,4,5,6,7,8,9] km/s
2 sizes int[10] = [10,11,12,13,14,15,16,17,18,19] cm
3 temperatures float[10] = [20,21,22,23,24,25,26,27,28,29] K

```

settings	
File:	settings.dip
Source:	PDF_FILE1:1

```

1 runtime
2     t_max = 10 ns
3     timestep = 0.01 ns
4
5 box
6     geometry = 3
7     size
8         x = 10 nm
9         y = 3e7 nm
10
11 modules
12     heating = false
13     radiation = true

```