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

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
```