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.directory	1				
simulation.name		1			
simulation.precision		1			

Node list

box.geometry

PDF_FILE1:20	uint16
Value:	3
Injection:	{settings?box.geometry}
Options:	1, 2, 3
Description:	Type of grid geometry

box.size.vy

PDF_FILE1:38	float64
Value:	23.000
Default Unit:	km/s

box.size.x

PDF_FILE1:27	float128
Default Unit:	cm
Condition:	{?} > 0
Description:	Box size in X direction
settings:8	mod
Value:	10
Default Unit:	nm

box.size.y

PDF_FILE1:32	float64
Default Unit:	cm
Options:	3.0 cm, 4.0 cm
Description:	Box size in Y direction
PDF_FILE1:37	float64
Value:	34.000
Default Unit:	au
settings:9	mod
Value:	3e7
Default Unit:	nm

box.size.z

PDF_FILE1:43	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_FILE1:55	bool
Tags:	preprocessor
Description:	Switch on heating module
settings:12	mod
Value:	false

modules.hydrodynamics

PDF_FILE1:52	bool
Value:	true
Tags:	preprocessor
Description:	Switch on hydrodynamics module

modules.radiation

PDF_FILE1:58	bool
Tags:	preprocessor
Description:	Switch on radiation module
settings:13	mod
Value:	true

runtime.t_max

PDF_FILE1:11	float64
Default Unit:	s
Condition:	{?} > 0
Description:	Maximum simulation time
settings:2	mod
Value:	10
Default Unit:	ns

runtime.timestep

PDF_FILE1:14	float64
Default Unit:	s
Condition:	{?} < {?runtime.t_max} && {?} > 0
Description:	Simulation time step
settings:3	mod
Value:	0.01
Default Unit:	ns

simulation.directory

PDF_FILE1:8	mod
Injection:	{pahts?simulation.directory}

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

```
$unit length = 1 cm
$unit mass = 2 g

cfl_factor float = 0.7  # Courant-Friedrichs-Lewy condition
max_vare float = 0.2    # maximum energy change of electrons
max_vari float = 0.2    # maximum energy change of ions
```

PDF_FILE1	
File:	definitions.dip
Source:	PDF_ROOT:37

```
$source settings = settings.dip

simulation
  name str = "simulation"
    !format "[a-zA-Z_-]+"
  precision str = "double"
    !options ["double","float"]
  directory = {paths?simulation.directory}

runtime
  t_max float s              # mandatory
    !condition ("{?} > 0")
    !description "Maximum simulation time"
  timestep float s
    !condition ("{?} < {?runtime.t_max} && {?} > 0")  # mandatory
    !description "Simulation time step"
  {settings?runtime.*}

box
  geometry uint16 = {settings?box.geometry}  # mandatory
    = 1  # linear
    = 2  # cylindrical
    = 3  # spherical
    !description "Type of grid geometry"

  size
    x float128 cm            # mandatory
      !condition ("{?} > 0")
      !description "Box size in X direction"
    #y float cm               # first declared here
    @case ("{?box.geometry} == 2")
      y float cm             # mandatory if geometry is non-linear
        = 3 cm
        = 4 cm
        !description "Box size in Y direction"
    @case ("{?box.geometry} == 3")
      y float = 34 au
      vy float = 23 km/s
    #@else
    #  y float = 3 m
    @end
    @case ("{?box.geometry} == 3")
      z float = 23 cm        # constant
        = 10 m
        !options [20,23,26] cm
        !description "Box size in Z direction"
        !constant
```

```
48      @end
49      {settings?box.size.*}
50
51    modules
52      hydrodynamics bool = true  # optional
53        !description "Switch on hydrodynamics module"
54        !tags ["preprocessor"]
55      heating bool               # mandatory
56        !description "Switch on heating module"
57        !tags ["preprocessor"]
58      radiation bool             # mandatory
59        !description "Switch on radiation module"
60        !tags ["preprocessor"]
61
62      {settings?modules.*}
63
64    cells
65      {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
```