

# Example DIP documentation

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# Introduction

In this document we want to demonstrate basic capabilities of a DIP documentation.

The documentation is structured into 3 main sections. The first section summarizes all parameters in a DIP code, as well as their corresponding node definitions, declarations, modifications and corresponding properties. Following section summarizes all references of injected values and lists imported nodes. The final section gives an overview of custom units and code sources.

Parameters, nodes, sections and many other items in this documentation are cross-linked between each other. All hyperlinks are denoted with a blue text.

# Parameters

## Node types

	Declaration		Injection
	Definition		Import
	Declaration / Modification		
	Definition / Modification		
	Modification		

## Parameter list

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

## Parameter nodes

### box.geometry

PDF_FILE1:20   injected		uint16
Value:	3	
Options:	1, 2, 3	
Description:	Type of grid geometry	

### box.size.vy

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

### box.size.x

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

### box.size.y

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

### box.size.z

PDF_FILE1:43		constant float64
Value:	23.000	
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   imported		float64
Value:	[0.0, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0]	
Unit:	km/s	

### cells.sizes

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

### cells.temperatures

cells:3   imported		float64
Value:	[20.0, 21.0, 22.0, 23.0, 24.0, 25.0, 26.0, 27.0, 28.0, 29.0]	
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_FILE1:57		bool
Tags:	preprocessor	
Description:	Switch on heating module	
settings:12   imported		mod
Value:	false	

### modules.hydrodynamics

PDF_FILE1:54		bool
Value:	true	
Tags:	preprocessor	
Description:	Switch on hydrodynamics module	

### modules.radiation

PDF_FILE1:60		bool
--------------	--	------

Tags:	preprocessor
Description:	Switch on radiation module
<a href="#">settings:13   imported</a> mod	
Value:	true

#### runtime.t\_max

<a href="#">PDF_FILE1:11</a> float64	
Unit:	s
Condition:	{?} > 0
Description:	Maximum simulation time
<a href="#">settings:2   imported</a> mod	
Value:	10
Unit:	ns

#### runtime.timestep

<a href="#">PDF_FILE1:14</a> float64	
Unit:	s
Condition:	{?} < {?runtime.t_max} && {?} > 0
Description:	Simulation time step
<a href="#">settings:3   imported</a> mod	
Value:	0.01
Unit:	ns

#### simulation.directory

<a href="#">PDF_FILE1:8   injected</a> mod	
--	--

#### simulation.name

<a href="#">PDF_FILE1:4</a> str	
Value:	simulation
Format:	[a-zA-Z_-]+

#### simulation.precision

<a href="#">PDF_FILE1:6</a> str	
Value:	double
Options:	double, float

# References

## Injected values

PDF_FILE1:8	
Injecting node:	simulation.directory
Request:	{pahts?simulation.directory}
PDF_FILE1:20	
Injecting node:	box.geometry
Request:	{settings?box.geometry}
From source:	settings:6
Value:	3

## Imported nodes

PDF_FILE1:17		
Request:	{settings?runtime.*}	
Imported node:		From source:
runtime.t_max		settings:2
runtime.timestep		settings:3

PDF_FILE1:49		
Request:	{settings?box.size.*}	
Imported node:		From source:
box.size.x		settings:8
box.size.y		settings:9

PDF_FILE1:51		
Request:	{options?box.boundary.*}	

PDF_FILE1:64		
Request:	{settings?modules.*}	
Imported node:		From source:
modules.heating		settings:12
modules.radiation		settings:13

PDF_FILE1:67		
Request:	{cells?*}	
Imported node:		From source:
cells.densities		cells:1
cells.sizes		cells:2
cells.temperatures		cells:3



# Settings

## List of units

Name	Value	Units	Source
[velocity]	13	cm/s	<a href="#">PDF_ROOT:25</a>
[length]	1	cm	<a href="#">PDF_STRING1:1</a>
[mass]	2	g	<a href="#">PDF_STRING1:2</a>

## List of sources

PDF_ROOT	
File:	build_export_docs.py
PDF_STRING1	
File:	build_export_docs.py
Source:	<a href="#">PDF_ROOT:26</a>
<pre>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</pre>	
PDF_FILE1	
File:	definitions.dip
Source:	<a href="#">PDF_ROOT:35</a>
<pre>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      directory = {pahts?simulation.directory} 9 10 runtime 11     t_max float s # mandatory 12     !condition ("{?} &gt; 0") 13     !description "Maximum simulation time" 14     timestep float s 15     !condition ("{?} &lt; {?runtime.t_max} &amp;&amp; {?} &gt; 0") # mandatory 16     !description "Simulation time step" 17     {settings?runtime.*} 18 19 box 20     geometry uint16 = {settings?box.geometry} # mandatory 21     = 1 # linear 22     = 2 # cylindrical 23     = 3 # spherical 24     !description "Type of grid geometry" 25 26 size 27     x float128 cm # mandatory 28     !condition ("{?} &gt; 0") 29     !description "Box size in X direction" 30     #y float cm # first declared here 31     @case ("{?box.geometry} == 2") 32         y float cm # mandatory if geometry is non-linear 33         = 3 cm 34         = 4 cm 35         !description "Box size in Y direction" 36     @case ("{?box.geometry} == 3") 37         y float = 34 au 38         vy float = 23 km/s 39     #@else 40     # y float = 3 m 41     @end 42     @case ("{?box.geometry} == 3") 43         z float = 23 cm # constant 44         = 10 m 45         !options [20,23,26] cm 46         !description "Box size in Z direction"</pre>	

```

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

```

## cells

File:	cells.dip
Source:	<a href="#">PDF_ROOT:34</a>

```

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:	<a href="#">PDF_FILE1:1</a>

```

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

```