

XNLO - UPPE

1.3.0

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Chapter 1

Class Index

1.1 Class List

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Chapter 2

File Index

2.1 File List

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/home/sam/Project/XNLO/UPPE/src/keldysh_gas.hpp	45
/home/sam/Project/XNLO/UPPE/src/laser_pulse.cpp	46
/home/sam/Project/XNLO/UPPE/src/laser_pulse.hpp	47
/home/sam/Project/XNLO/UPPE/src/main.cpp	48
/home/sam/Project/XNLO/UPPE/src/math_textbook.cpp	49
/home/sam/Project/XNLO/UPPE/src/math_textbook.hpp	49
/home/sam/Project/XNLO/UPPE/src/physics_textbook.cpp	50
/home/sam/Project/XNLO/UPPE/src/physics_textbook.hpp	50
/home/sam/Project/XNLO/UPPE/src/version.hpp	51

Chapter 3

Class Documentation

3.1 capillary_fibre Class Reference

```
#include <capillary_fibre.hpp>
```

Public Member Functions

- [capillary_fibre](#) (double *Z_*, [grid_rkr](#) &*rkr_*, [grid_tw](#) &*tw_*, [physics_textbook](#) &*physics_*, [maths_textbook](#) &*maths_*)

Public Attributes

- ArrayXXcd [gamma](#)
- double [Z](#)
- double [R](#)
- double [n_glass](#)

3.1.1 Detailed Description

Originally created by Patrick Anderson. Modified by Samuel Senior on 10/03/2017. "capillary_fibre" describes the dimensions and dispersion properties of a dielectric capillary type fibre.

3.1.2 Constructor & Destructor Documentation

3.1.2.1 `capillary_fibre::capillary_fibre (double Z_, grid_rkr & rkr_, grid_tw & tw_, physics_textbook & physics_, maths_textbook & maths_)`

Constructor

3.1.3 Member Data Documentation

3.1.3.1 `ArrayXXcd capillary_fibre::gamma`

3.1.3.2 `double capillary_fibre::n_glass`

3.1.3.3 `double capillary_fibre::R`

3.1.3.4 `double capillary_fibre::Z`

The documentation for this class was generated from the following files:

- [/home/sam/Project/XNLO/UPPE/src/capillary_fibre.hpp](#)
- [/home/sam/Project/XNLO/UPPE/src/capillary_fibre.cpp](#)

3.2 Config_Settings Class Reference

```
#include <config_settings.hpp>
```

Public Member Functions

- [Config_Settings](#) ()
- void [read_in](#) (std::string, bool print_to_screen=true)
- void [check_paths](#) (bool print_to_screen=true)
- void [step_path](#) (int step)
- void [print](#) ()
- void [print](#) (std::string)
- int [n_z](#) ()
- void [n_z_set](#) (int)
- std::string [n_z_description](#) ()
- void [n_z_description_set](#) (std::string)
- int [n_r](#) ()
- void [n_r_set](#) (int)
- std::string [n_r_description](#) ()
- void [n_r_description_set](#) (std::string)
- int [n_m](#) ()
- void [n_m_set](#) (int)
- std::string [n_m_description](#) ()
- void [n_m_description_set](#) (std::string)
- int [n_t](#) ()
- void [n_t_set](#) (int)
- std::string [n_t_description](#) ()
- void [n_t_description_set](#) (std::string)
- double [T](#) ()
- void [T_set](#) (double)
- std::string [T_description](#) ()
- void [T_description_set](#) (std::string)
- double [w_active_min](#) ()
- void [w_active_min_set](#) (double)

- `std::string w_active_min_description ()`
- `void w_active_min_description_set (std::string)`
- `double w_active_max ()`
- `void w_active_max_set (double)`
- `std::string w_active_max_description ()`
- `void w_active_max_description_set (std::string)`
- `double Z ()`
- `void Z_set (double)`
- `std::string Z_description ()`
- `void Z_description_set (std::string)`
- `double R ()`
- `void R_set (double)`
- `std::string R_description ()`
- `void R_description_set (std::string)`
- `double press ()`
- `void press_set (double)`
- `std::string press_description ()`
- `void press_description_set (std::string)`
- `double p_av ()`
- `void p_av_set (double)`
- `std::string p_av_description ()`
- `void p_av_description_set (std::string)`
- `double rep ()`
- `void rep_set (double)`
- `std::string rep_description ()`
- `void rep_description_set (std::string)`
- `double fwhm ()`
- `void fwhm_set (double)`
- `std::string fwhm_description ()`
- `void fwhm_description_set (std::string)`
- `double l_0 ()`
- `void l_0_set (double)`
- `std::string l_0_description ()`
- `void l_0_description_set (std::string)`
- `double ceo ()`
- `void ceo_set (double)`
- `std::string ceo_description ()`
- `void ceo_description_set (std::string)`
- `double waist ()`
- `void waist_set (double)`
- `std::string waist_description ()`
- `void waist_description_set (std::string)`
- `std::string pend_path ()`
- `void pend_path_set (std::string)`
- `std::string pend_path_description ()`
- `void pend_path_description_set (std::string)`
- `std::string path_input_j0 ()`
- `void path_input_j0_set (std::string)`
- `std::string path_input_j0_description ()`
- `void path_input_j0_description_set (std::string)`
- `std::string path_A_w_R ()`
- `void path_A_w_R_set (std::string)`
- `std::string path_A_w_R_description ()`
- `void path_A_w_R_description_set (std::string)`
- `std::string path_A_w_I ()`

- void [path_A_w_I_set](#) (std::string)
- std::string [path_A_w_I_description](#) ()
- void [path_A_w_I_description_set](#) (std::string)
- std::string [path_w_active](#) ()
- void [path_w_active_set](#) (std::string)
- std::string [path_w_active_description](#) ()
- void [path_w_active_description_set](#) (std::string)
- std::string [path_electron_density](#) ()
- void [path_electron_density_set](#) (std::string)
- std::string [path_electron_density_description](#) ()
- void [path_electron_density_description_set](#) (std::string)
- std::string [path_HHG_R](#) ()
- void [path_HHG_R_set](#) (std::string)
- std::string [path_HHG_R_description](#) ()
- void [path_HHG_R_description_set](#) (std::string)
- std::string [path_HHG_I](#) ()
- void [path_HHG_I_set](#) (std::string)
- std::string [path_HHG_I_description](#) ()
- void [path_HHG_I_description_set](#) (std::string)
- std::string [path_HHG_w](#) ()
- void [path_HHG_w_set](#) (std::string)
- std::string [path_HHG_w_description](#) ()
- void [path_HHG_w_description_set](#) (std::string)
- std::string [path_HHG_E](#) ()
- void [path_HHG_E_set](#) (std::string)
- std::string [path_HHG_E_description](#) ()
- void [path_HHG_E_description_set](#) (std::string)
- std::string [path_config_file](#) ()
- void [path_config_file_set](#) (std::string)
- std::string [path_config_file_description](#) ()
- void [path_config_file_description_set](#) (std::string)
- std::string [path_config_log](#) ()
- void [path_config_log_set](#) (std::string)
- std::string [path_config_log_description](#) ()
- void [path_config_log_description_set](#) (std::string)

Private Types

- enum [SN](#) {
[SN::n_z](#) = 0, [SN::n_r](#), [SN::n_m](#), [SN::n_t](#),
[SN::T](#), [SN::w_active_min](#), [SN::w_active_max](#), [SN::Z](#),
[SN::R](#), [SN::press](#), [SN::p_av](#), [SN::rep](#),
[SN::fwhm](#), [SN::l_0](#), [SN::ceo](#), [SN::waist](#),
[SN::pend_path](#), [SN::path_input_j0](#), [SN::path_A_w_R](#), [SN::path_A_w_I](#),
[SN::path_w_active](#), [SN::path_HHG_R](#), [SN::path_HHG_I](#), [SN::path_HHG_w](#),
[SN::path_HHG_E](#), [SN::path_config_file](#), [SN::path_config_log](#), [SN::LAST_SN_ENTRY](#) }

Private Member Functions

- void [set_variable](#) (std::string &, std::string &, std::string &, bool print_to_screen=true)
- std::string [set_path](#) (std::string, std::string, std::string pend="")
- std::string [set_pre_path](#) (std::string, std::string)
- std::string [set_post_path](#) (std::string, std::string)

Private Attributes

- int `n_z_` = 50
- int `n_r_` = 20
- int `n_m_` = 20
- int `n_t_` = 4096
- double `T_` = 500.0e-15
- double `w_active_min_` = 2.0e14
- double `w_active_max_` = 8.0e15
- double `Z_` = 5.0e-3
- double `R_` = 75.0e-6
- double `press_` = 100.0e-3
- double `p_av_` = 1.0
- double `rep_` = 1.0e3
- double `fwhm_` = 40e-15
- double `l_0_` = 800e-9
- double `ceo_` = 0.0
- double `waist_` = 48.0e-6
- std::string `path_input_j0_` = "../input/J0_zeros.bin"
- std::string `path_A_w_R_` = "../output/A_w_R.bin"
- std::string `path_A_w_I_` = "../output/A_w_I.bin"
- std::string `path_w_active_` = "../output/w_active.bin"
- std::string `path_electron_density_` = "../output/electron_density.bin"
- std::string `path_HHG_R_` = "../output/HHG_R.bin"
- std::string `path_HHG_I_` = "../output/HHG_I.bin"
- std::string `path_HHG_w_` = "../output/HHG_w.bin"
- std::string `path_HHG_E_` = "../output/HHG_E.bin"
- std::string `path_config_file_` = "/config.txt"
- std::string `path_config_log_` = "../output/config_log.txt"
- std::string `pend_path_` = "prepend"
- std::string `n_z_description_` = "(default) (int) Number of steps in Z"
- std::string `n_r_description_` = "(default) (int) The z_r value"
- std::string `n_m_description_` = "(default) (int) Number of modes"
- std::string `n_t_description_` = "(default) (int) The z_t value"
- std::string `T_description_` = "(default) (double) The T value"
- std::string `w_active_min_description_` = "(default) (double) Minimum angular frequency"
- std::string `w_active_max_description_` = "(default) (double) Maximum angular frequency"
- std::string `Z_description_` = "(default) (double) Length of capillary"
- std::string `R_description_` = "(default) (double) Radius of capillary"
- std::string `press_description_` = "(default) (double) Pressure of the gas"
- std::string `p_av_description_` = "(default) (double) The p_av value"
- std::string `rep_description_` = "(default) (double) The rep value"
- std::string `fwhm_description_` = "(default) (double) Full width at half max"
- std::string `l_0_description_` = "(default) (double) Laser central wavelength"
- std::string `ceo_description_` = "(default) (double) The ceo value"
- std::string `waist_description_` = "(default) (double) The waist value"
- std::string `pend_path_description_` = "(default) (std::string) Pending switch"
- std::string `path_input_j0_description_` = "(default) (std::string) Path to J0_zeros.bin"
- std::string `path_A_w_R_description_` = "(default) (std::string) Path of A_w_R"
- std::string `path_A_w_I_description_` = "(default) (std::string) Path of A_w_I"
- std::string `path_w_active_description_` = "(default) (std::string) Path of w_active"
- std::string `path_electron_density_description_` = "(default) (std::string) Path of electron_density"
- std::string `path_HHG_R_description_` = "(default) (std::string) Path of HHG_R"
- std::string `path_HHG_I_description_` = "(default) (std::string) Path of HHG_I"
- std::string `path_HHG_w_description_` = "(default) (std::string) Path of HHG w"
- std::string `path_HHG_E_description_` = "(default) (std::string) Path of HHG E"
- std::string `path_config_file_description_` = "(default) (std::string) config.txt path"
- std::string `path_config_log_description_` = "(default) (std::string) config_log.txt path"

Static Private Attributes

- static const char * [setting_name](#) []

3.2.1 Detailed Description

Modified by Samuel Senior on 05/02/2017. Reads in input parameters and settings from a config file.

3.2.2 Member Enumeration Documentation

3.2.2.1 enum Config_Settings::SN [strong],[private]

Enumerator

n_z
n_r
n_m
n_t
T
w_active_min
w_active_max
Z
R
press
p_av
rep
fwhm
I_0
ceo
waist
pend_path
path_input_j0
path_A_w_R
path_A_w_I
path_w_active
path_HHG_R
path_HHG_I
path_HHG_w
path_HHG_E
path_config_file
path_config_log
LAST_SN_ENTRY

3.2.3 Constructor & Destructor Documentation

3.2.3.1 Config_Settings::Config_Settings ()

Constructor

3.2.4 Member Function Documentation

3.2.4.1 double Config_Settings::ceo ()

3.2.4.2 std::string Config_Settings::ceo_description ()

3.2.4.3 void Config_Settings::ceo_description_set (std::string *description*)

3.2.4.4 void Config_Settings::ceo_set (double *value*)

3.2.4.5 void Config_Settings::check_paths (bool *print_to_screen* = `true`)

3.2.4.6 double Config_Settings::fwhm ()

3.2.4.7 std::string Config_Settings::fwhm_description ()

3.2.4.8 void Config_Settings::fwhm_description_set (std::string *description*)

3.2.4.9 void Config_Settings::fwhm_set (double *value*)

3.2.4.10 double Config_Settings::l_0 ()

3.2.4.11 std::string Config_Settings::l_0_description ()

3.2.4.12 void Config_Settings::l_0_description_set (std::string *description*)

3.2.4.13 void Config_Settings::l_0_set (double *value*)

3.2.4.14 int Config_Settings::n_m ()

3.2.4.15 std::string Config_Settings::n_m_description ()

3.2.4.16 void Config_Settings::n_m_description_set (std::string *description*)

3.2.4.17 void Config_Settings::n_m_set (int *value*)

3.2.4.18 int Config_Settings::n_r ()

3.2.4.19 std::string Config_Settings::n_r_description ()

3.2.4.20 void Config_Settings::n_r_description_set (std::string *description*)

3.2.4.21 void Config_Settings::n_r_set (int *value*)

3.2.4.22 int Config_Settings::n_t ()

3.2.4.23 std::string Config_Settings::n_t_description ()

3.2.4.24 void Config_Settings::n_t_description_set (std::string *description*)

3.2.4.25 void Config_Settings::n_t_set (int *value*)

3.2.4.26 int Config_Settings::n_z ()

3.2.4.27 std::string Config_Settings::n_z_description ()

3.2.4.28 void Config_Settings::n_z_description_set (std::string *description*)

3.2.4.29 void Config_Settings::n_z_set (int *value*)

3.2.4.30 double Config_Settings::p_av ()

3.2.4.31 std::string Config_Settings::p_av_description ()

3.2.4.32 void Config_Settings::p_av_description_set (std::string *description*)

3.2.4.33 void Config_Settings::p_av_set (double *value*)

3.2.4.34 std::string Config_Settings::path_A_w_I ()

3.2.4.35 std::string Config_Settings::path_A_w_I_description ()

3.2.4.36 void Config_Settings::path_A_w_I_description_set (std::string *description*)

3.2.4.37 void Config_Settings::path_A_w_I_set (std::string *value*)

3.2.4.38 std::string Config_Settings::path_A_w_R ()

3.2.4.39 std::string Config_Settings::path_A_w_R_description ()

3.2.4.40 void Config_Settings::path_A_w_R_description_set (std::string *description*)

3.2.4.41 void Config_Settings::path_A_w_R_set (std::string *value*)

3.2.4.42 std::string Config_Settings::path_config_file ()

- 3.2.4.43 `std::string Config_Settings::path_config_file_description ()`
- 3.2.4.44 `void Config_Settings::path_config_file_description_set (std::string description)`
- 3.2.4.45 `void Config_Settings::path_config_file_set (std::string value)`
- 3.2.4.46 `std::string Config_Settings::path_config_log ()`
- 3.2.4.47 `std::string Config_Settings::path_config_log_description ()`
- 3.2.4.48 `void Config_Settings::path_config_log_description_set (std::string description)`
- 3.2.4.49 `void Config_Settings::path_config_log_set (std::string value)`
- 3.2.4.50 `std::string Config_Settings::path_electron_density ()`
- 3.2.4.51 `std::string Config_Settings::path_electron_density_description ()`
- 3.2.4.52 `void Config_Settings::path_electron_density_description_set (std::string description)`
- 3.2.4.53 `void Config_Settings::path_electron_density_set (std::string value)`
- 3.2.4.54 `std::string Config_Settings::path_HHG_E ()`
- 3.2.4.55 `std::string Config_Settings::path_HHG_E_description ()`
- 3.2.4.56 `void Config_Settings::path_HHG_E_description_set (std::string description)`
- 3.2.4.57 `void Config_Settings::path_HHG_E_set (std::string value)`
- 3.2.4.58 `std::string Config_Settings::path_HHG_I ()`
- 3.2.4.59 `std::string Config_Settings::path_HHG_I_description ()`
- 3.2.4.60 `void Config_Settings::path_HHG_I_description_set (std::string description)`
- 3.2.4.61 `void Config_Settings::path_HHG_I_set (std::string value)`
- 3.2.4.62 `std::string Config_Settings::path_HHG_R ()`
- 3.2.4.63 `std::string Config_Settings::path_HHG_R_description ()`
- 3.2.4.64 `void Config_Settings::path_HHG_R_description_set (std::string description)`
- 3.2.4.65 `void Config_Settings::path_HHG_R_set (std::string value)`

- 3.2.4.66 `std::string Config_Settings::path_HHG_w ()`
- 3.2.4.67 `std::string Config_Settings::path_HHG_w_description ()`
- 3.2.4.68 `void Config_Settings::path_HHG_w_description_set (std::string description)`
- 3.2.4.69 `void Config_Settings::path_HHG_w_set (std::string value)`
- 3.2.4.70 `std::string Config_Settings::path_input_j0 ()`
- 3.2.4.71 `std::string Config_Settings::path_input_j0_description ()`
- 3.2.4.72 `void Config_Settings::path_input_j0_description_set (std::string description)`
- 3.2.4.73 `void Config_Settings::path_input_j0_set (std::string value)`
- 3.2.4.74 `std::string Config_Settings::path_w_active ()`
- 3.2.4.75 `std::string Config_Settings::path_w_active_description ()`
- 3.2.4.76 `void Config_Settings::path_w_active_description_set (std::string description)`
- 3.2.4.77 `void Config_Settings::path_w_active_set (std::string value)`
- 3.2.4.78 `std::string Config_Settings::pend_path ()`
- 3.2.4.79 `std::string Config_Settings::pend_path_description ()`
- 3.2.4.80 `void Config_Settings::pend_path_description_set (std::string description)`
- 3.2.4.81 `void Config_Settings::pend_path_set (std::string value)`
- 3.2.4.82 `double Config_Settings::press ()`
- 3.2.4.83 `std::string Config_Settings::press_description ()`
- 3.2.4.84 `void Config_Settings::press_description_set (std::string description)`
- 3.2.4.85 `void Config_Settings::press_set (double value)`
- 3.2.4.86 `void Config_Settings::print ()`
- 3.2.4.87 `void Config_Settings::print (std::string path_)`
- 3.2.4.88 `double Config_Settings::R ()`

- 3.2.4.89 `std::string Config_Settings::R_description ()`
- 3.2.4.90 `void Config_Settings::R_description_set (std::string description)`
- 3.2.4.91 `void Config_Settings::R_set (double value)`
- 3.2.4.92 `void Config_Settings::read_in (std::string path, bool print_to_screen = true)`
- 3.2.4.93 `double Config_Settings::rep ()`
- 3.2.4.94 `std::string Config_Settings::rep_description ()`
- 3.2.4.95 `void Config_Settings::rep_description_set (std::string description)`
- 3.2.4.96 `void Config_Settings::rep_set (double value)`
- 3.2.4.97 `std::string Config_Settings::set_path (std::string path, std::string pending_string, std::string pend = " ")`
[private]
- 3.2.4.98 `std::string Config_Settings::set_post_path (std::string path, std::string post_path)` [private]
- 3.2.4.99 `std::string Config_Settings::set_pre_path (std::string pre_path, std::string path)` [private]
- 3.2.4.100 `void Config_Settings::set_variable (std::string & variable_name, std::string & variable_value_str, std::string & input_description_char, bool print_to_screen = true)` [private]
- 3.2.4.101 `void Config_Settings::step_path (int step)`
- 3.2.4.102 `double Config_Settings::T ()`
- 3.2.4.103 `std::string Config_Settings::T_description ()`
- 3.2.4.104 `void Config_Settings::T_description_set (std::string description)`
- 3.2.4.105 `void Config_Settings::T_set (double value)`
- 3.2.4.106 `double Config_Settings::w_active_max ()`
- 3.2.4.107 `std::string Config_Settings::w_active_max_description ()`
- 3.2.4.108 `void Config_Settings::w_active_max_description_set (std::string description)`
- 3.2.4.109 `void Config_Settings::w_active_max_set (double value)`
- 3.2.4.110 `double Config_Settings::w_active_min ()`

- 3.2.4.111 `std::string Config_Settings::w_active_min_description ()`
- 3.2.4.112 `void Config_Settings::w_active_min_description_set (std::string description)`
- 3.2.4.113 `void Config_Settings::w_active_min_set (double value)`
- 3.2.4.114 `double Config_Settings::waist ()`
- 3.2.4.115 `std::string Config_Settings::waist_description ()`
- 3.2.4.116 `void Config_Settings::waist_description_set (std::string description)`
- 3.2.4.117 `void Config_Settings::waist_set (double value)`
- 3.2.4.118 `double Config_Settings::Z ()`
- 3.2.4.119 `std::string Config_Settings::Z_description ()`
- 3.2.4.120 `void Config_Settings::Z_description_set (std::string description)`
- 3.2.4.121 `void Config_Settings::Z_set (double value)`

3.2.5 Member Data Documentation

- 3.2.5.1 `double Config_Settings::ceo_ = 0.0 [private]`
- 3.2.5.2 `std::string Config_Settings::ceo_description_ = "(default) (double) The ceo value" [private]`
- 3.2.5.3 `double Config_Settings::fwhm_ = 40e-15 [private]`
- 3.2.5.4 `std::string Config_Settings::fwhm_description_ = "(default) (double) Full width at half max" [private]`
- 3.2.5.5 `double Config_Settings::l_0_ = 800e-9 [private]`
- 3.2.5.6 `std::string Config_Settings::l_0_description_ = "(default) (double) Laser central wavelength" [private]`
- 3.2.5.7 `int Config_Settings::n_m_ = 20 [private]`
- 3.2.5.8 `std::string Config_Settings::n_m_description_ = "(default) (int) Number of modes" [private]`
- 3.2.5.9 `int Config_Settings::n_r_ = 20 [private]`
- 3.2.5.10 `std::string Config_Settings::n_r_description_ = "(default) (int) The z_r value" [private]`
- 3.2.5.11 `int Config_Settings::n_t_ = 4096 [private]`

- 3.2.5.12 `std::string Config_Settings::n_t_description_ = "(default) (int) The z_t value" [private]`
- 3.2.5.13 `int Config_Settings::n_z_ = 50 [private]`
- 3.2.5.14 `std::string Config_Settings::n_z_description_ = "(default) (int) Number of steps in Z" [private]`
- 3.2.5.15 `double Config_Settings::p_av_ = 1.0 [private]`
- 3.2.5.16 `std::string Config_Settings::p_av_description_ = "(default) (double) The p_av value" [private]`
- 3.2.5.17 `std::string Config_Settings::path_A_w_I_ = "../output/A_w_I.bin" [private]`
- 3.2.5.18 `std::string Config_Settings::path_A_w_I_description_ = "(default) (std::string) Path of A_w_I" [private]`
- 3.2.5.19 `std::string Config_Settings::path_A_w_R_ = "../output/A_w_R.bin" [private]`
- 3.2.5.20 `std::string Config_Settings::path_A_w_R_description_ = "(default) (std::string) Path of A_w_R" [private]`
- 3.2.5.21 `std::string Config_Settings::path_config_file_ = "/config.txt" [private]`
- 3.2.5.22 `std::string Config_Settings::path_config_file_description_ = "(default) (std::string) config.txt path" [private]`
- 3.2.5.23 `std::string Config_Settings::path_config_log_ = "../output/config_log.txt" [private]`
- 3.2.5.24 `std::string Config_Settings::path_config_log_description_ = "(default) (std::string) config_log.txt path" [private]`
- 3.2.5.25 `std::string Config_Settings::path_electron_density_ = "../output/electron_density.bin" [private]`
- 3.2.5.26 `std::string Config_Settings::path_electron_density_description_ = "(default) (std::string) Path of electron_density" [private]`
- 3.2.5.27 `std::string Config_Settings::path_HHG_E_ = "../output/HHG_E.bin" [private]`
- 3.2.5.28 `std::string Config_Settings::path_HHG_E_description_ = "(default) (std::string) Path of HHG E" [private]`
- 3.2.5.29 `std::string Config_Settings::path_HHG_I_ = "../output/HHG_I.bin" [private]`
- 3.2.5.30 `std::string Config_Settings::path_HHG_I_description_ = "(default) (std::string) Path of HHG_I" [private]`
- 3.2.5.31 `std::string Config_Settings::path_HHG_R_ = "../output/HHG_R.bin" [private]`
- 3.2.5.32 `std::string Config_Settings::path_HHG_R_description_ = "(default) (std::string) Path of HHG_R" [private]`
- 3.2.5.33 `std::string Config_Settings::path_HHG_w_ = "../output/HHG_w.bin" [private]`

- 3.2.5.34 `std::string Config_Settings::path_HHG_w_description_ = "(default) (std::string) Path of HHG w"` [private]
- 3.2.5.35 `std::string Config_Settings::path_input_j0_ = "../input/J0_zeros.bin"` [private]
- 3.2.5.36 `std::string Config_Settings::path_input_j0_description_ = "(default) (std::string) Path to J0_zeros.bin"` [private]
- 3.2.5.37 `std::string Config_Settings::path_w_active_ = "../output/w_active.bin"` [private]
- 3.2.5.38 `std::string Config_Settings::path_w_active_description_ = "(default) (std::string) Path of w_active"` [private]
- 3.2.5.39 `std::string Config_Settings::pend_path_ = "prepend"` [private]
- 3.2.5.40 `std::string Config_Settings::pend_path_description_ = "(default) (std::string) Pending switch"` [private]
- 3.2.5.41 `double Config_Settings::press_ = 100.0e-3` [private]
- 3.2.5.42 `std::string Config_Settings::press_description_ = "(default) (double) Pressure of the gas"` [private]
- 3.2.5.43 `double Config_Settings::R_ = 75.0e-6` [private]
- 3.2.5.44 `std::string Config_Settings::R_description_ = "(default) (double) Radius of capillary"` [private]
- 3.2.5.45 `double Config_Settings::rep_ = 1.0e3` [private]
- 3.2.5.46 `std::string Config_Settings::rep_description_ = "(default) (double) The rep value"` [private]
- 3.2.5.47 `const char * Config_Settings::setting_name` [static],[private]

Initial value:

```
= {
    "n_z", "n_r", "n_m",
    "n_t", "I", "w_active_min", "w_active_max",
    "z", "R",
    "press",
    "p_av", "rep", "fwhm", "l_0", "ceo", "waist",
    "pend_path",
    "path_input_j0",
    "path_A_w_R", "path_A_w_I", "path_w_active",
    "path_HHG_R", "path_HHG_I", "path_HHG_w", "path_HHG_E",
    "path_config_file", "path_config_log"
}
```


- 3.2.5.48 `double Config_Settings::T_ = 500.0e-15` `[private]`
- 3.2.5.49 `std::string Config_Settings::T_description_ = "(default) (double) The T value"` `[private]`
- 3.2.5.50 `double Config_Settings::w_active_max_ = 8.0e15` `[private]`
- 3.2.5.51 `std::string Config_Settings::w_active_max_description_ = "(default) (double) Maximum angular frequency"`
`[private]`
- 3.2.5.52 `double Config_Settings::w_active_min_ = 2.0e14` `[private]`
- 3.2.5.53 `std::string Config_Settings::w_active_min_description_ = "(default) (double) Minimum angular frequency"`
`[private]`
- 3.2.5.54 `double Config_Settings::waist_ = 48.0e-6` `[private]`
- 3.2.5.55 `std::string Config_Settings::waist_description_ = "(default) (double) The waist value"` `[private]`
- 3.2.5.56 `double Config_Settings::Z_ = 5.0e-3` `[private]`
- 3.2.5.57 `std::string Config_Settings::Z_description_ = "(default) (double) Length of capillary"` `[private]`

The documentation for this class was generated from the following files:

- [/home/sam/Project/XNLO/UPPE/src/config_settings.hpp](#)
- [/home/sam/Project/XNLO/UPPE/src/config_settings.cpp](#)

3.3 DHT Class Reference

```
#include <DHT.hpp>
```

Public Member Functions

- [DHT](#) ()
- [DHT](#) (int n_r_, [maths_textbook](#) &maths_)
- Eigen::ArrayXcd [forward](#) (Eigen::ArrayXcd f_r_)
- Eigen::ArrayXcd [backward](#) (Eigen::ArrayXcd f_kr_)

Private Attributes

- MatrixXcd [H](#)

3.3.1 Detailed Description

Originally created by Patrick Anderson. Modified by Samuel Senior on 10/03/2017. "DHT" evaluates the forward and backward discrete Hankel transform. Based on Fisk, Computer Physics Communications, 43 (1987). Complex datatype used here, should really template/overload.

3.3.2 Constructor & Destructor Documentation

3.3.2.1 DHT::DHT ()

Default constructor

3.3.2.2 DHT::DHT (int *n_r_*, maths_textbook & *maths_*)

Parameterized constructor

3.3.3 Member Function Documentation

3.3.3.1 Eigen::ArrayXcd DHT::backward (Eigen::ArrayXcd *f_kr_*)

Backward transform

3.3.3.2 Eigen::ArrayXcd DHT::forward (Eigen::ArrayXcd *f_r_*)

Forward transform

3.3.4 Member Data Documentation

3.3.4.1 MatrixXcd DHT::H [private]

The documentation for this class was generated from the following files:

- [/home/sam/Project/XNLO/UPPE/src/DHT.hpp](#)
- [/home/sam/Project/XNLO/UPPE/src/DHT.cpp](#)

3.4 Dipole_moment Class Reference

```
#include <dipole_moment.hpp>
```

Public Member Functions

- [Dipole_moment](#) ()
- void [update_dipole_moment](#) ()
- ArrayXXd [get_moment](#) ()

Private Attributes

- ArrayXXd [dipole_data](#)

3.4.1 Detailed Description

Created by Samuel Senior on 10/03/2017. "dipole_moment" wraps around the dipole moment calculations and output files.

3.4.2 Constructor & Destructor Documentation

3.4.2.1 Dipole_moment::Dipole_moment ()

Constructor

3.4.3 Member Function Documentation

3.4.3.1 ArrayXXd Dipole_moment::get_moment ()

3.4.3.2 void Dipole_moment::update_dipole_moment ()

3.4.4 Member Data Documentation

3.4.4.1 ArrayXXd Dipole_moment::dipole_data [private]

The documentation for this class was generated from the following files:

- /home/sam/Project/XNLO/UPPE/src/[dipole_moment.hpp](#)
- /home/sam/Project/XNLO/UPPE/src/[dipole_moment.cpp](#)

3.5 grid_rkr Class Reference

```
#include <grid_rkr.hpp>
```

Public Member Functions

- [grid_rkr](#) ()
- [grid_rkr](#) (int n_r_, double R_, int n_m_, [maths_textbook](#) &maths_)

Public Attributes

- ArrayXd [r](#)
- ArrayXd [kr](#)
- int [n_r](#)
- double [R](#)
- int [n_m](#)

3.5.1 Detailed Description

Originally created by Patrick Anderson. Modified by Samuel Senior on 10/03/2017. "grid_rkr" is a non-uniform radial grid. The spectral counterpart of this grid is evaluated and accessible.

3.5.2 Constructor & Destructor Documentation

3.5.2.1 `grid_rkr::grid_rkr ()`

Default constructor

3.5.2.2 `grid_rkr::grid_rkr (int n_r, double R, int n_m, maths_textbook & maths_)`

Parameterized constructor

3.5.3 Member Data Documentation

3.5.3.1 `ArrayXd grid_rkr::kr`

3.5.3.2 `int grid_rkr::n_m`

3.5.3.3 `int grid_rkr::n_r`

3.5.3.4 `ArrayXd grid_rkr::r`

3.5.3.5 `double grid_rkr::R`

The documentation for this class was generated from the following files:

- [/home/sam/Project/XNLO/UPPE/src/grid_rkr.hpp](#)
- [/home/sam/Project/XNLO/UPPE/src/grid_rkr.cpp](#)

3.6 `grid_tw` Class Reference

```
#include <grid_tw.hpp>
```

Public Member Functions

- [`grid_tw`](#) ()
- [`grid_tw`](#) (int `N_t`, double `T`, double `w_active_min`, double `w_active_max`, [`maths_textbook`](#) &`maths`)

Public Attributes

- `ArrayXd` `t`
- `ArrayXd` `w_active`
- int `n_t`
- int `n_active`
- int `w_active_min_index`

3.6.1 Detailed Description

Originally created by Patrick Anderson. Modified by Samuel Senior on 10/03/2017. "`grid_tw`" is a linear temporal grid. The spectral counterpart of this grid is evaluated and made accessible.

3.6.2 Constructor & Destructor Documentation

3.6.2.1 `grid_tw::grid_tw` ()

3.6.2.2 `grid_tw::grid_tw` (int `n_t`, double `T`, double `w_active_min`, double `w_active_max`, `maths_textbook` & `maths`)

Parameterized Constructor

3.6.3 Member Data Documentation

3.6.3.1 int `grid_tw::n_active`

3.6.3.2 int `grid_tw::n_t`

3.6.3.3 `ArrayXd` `grid_tw::t`

3.6.3.4 `ArrayXd` `grid_tw::w_active`

3.6.3.5 int `grid_tw::w_active_min_index`

The documentation for this class was generated from the following files:

- `/home/sam/Project/XNLO/UPPE/src/grid_tw.hpp`
- `/home/sam/Project/XNLO/UPPE/src/grid_tw.cpp`

3.7 IO Class Reference

```
#include <IO.hpp>
```

Public Member Functions

- [IO](#) ()
- `Array< unsigned short, Dynamic, Dynamic > read_uint16 (const char *path_, int N_row_, int N_col_)`
- `ArrayXXi read_int (const char *path_, int N_row_, int N_col_)`
- `ArrayXXd read_double (const std::string path_, int N_row_, int N_col_)`
- `ArrayXXd read_ascii_double (const std::string path_, int N_row_, int N_col_)`
- `void write_double (const std::string path_, ArrayXXd input_, int N_row_, int N_col_, bool print=true)`
- `void write_header (const std::string path_, int N_row_, int N_col_, bool print=true)`
- `void overwrite (const std::string path, bool print=true)`
- `void write_ascii_double (ArrayXd data, std::string path, bool print=true)`

3.7.1 Detailed Description

Originally created by Patrick Anderson. Modified by Samuel Senior on 10/03/2017. "IO" objects enable reading/writing of binary files to/from Eigen arrays.

3.7.2 Constructor & Destructor Documentation

3.7.2.1 `IO::IO ()`

Constructor

3.7.3 Member Function Documentation

3.7.3.1 `void IO::overwrite (const std::string path, bool print = true)`

Overwrites given binary file.

3.7.3.2 `ArrayXXd IO::read_ascii_double (const std::string path, int N_row_, int N_col_)`

Read double to Eigen array from ascii file

3.7.3.3 `ArrayXXd IO::read_double (const std::string path_, int N_row_, int N_col_)`

Read double to Eigen array from binary file

3.7.3.4 `ArrayXXi IO::read_int (const char * path_, int N_row_, int N_col_)`

int

3.7.3.5 `Array< unsigned short, Dynamic, Dynamic > IO::read_uint16 (const char * path_, int N_row_, int N_col_)`

Read from binary file to *N_col_* by *N_row_* Eigen array uint16

3.7.3.6 `void IO::write_ascii_double (ArrayXd data, std::string path, bool print = true)`

3.7.3.7 `void IO::write_double (const std::string path_, ArrayXXd input_, int N_row_, int N_col_, bool print = true)`

Write to binary file from *N_col_* by *N_row_* Eigen array double

3.7.3.8 `void IO::write_header (const std::string path_, int N_row_, int N_col_, bool print = true)`

Write UPPE binary header to given binary file. Header takes the form: Offset Size (Bytes) Type/Contents Description
 0 4 'UPPE' Binary format name 4 4 int Version Number 8 4 int Subversion number 12 4 int Size of header 16 4 int
N_row 20 4 int *N_col* 24 4 int Total size of data 28 4 int Size of each double in the data

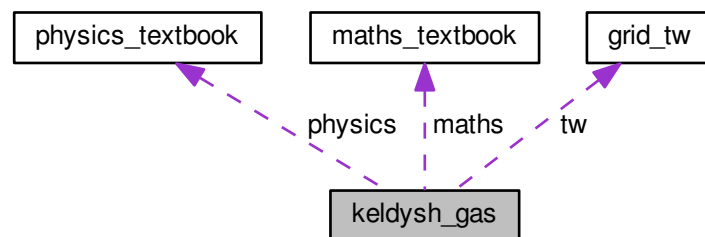
The documentation for this class was generated from the following files:

- [/home/sam/Project/XNLO/UPPE/src/IO.hpp](#)
- [/home/sam/Project/XNLO/UPPE/src/IO.cpp](#)

3.8 keldysh_gas Class Reference

```
#include <keldysh_gas.hpp>
```

Collaboration diagram for keldysh_gas:



Public Member Functions

- [keldysh_gas](#) (double *press_*, [grid_tw](#) &*tw_*, DFTI_DESCRIPTOR_HANDLE &*ft_*, [maths_textbook](#) &*maths_*)
- double [atom_density](#) (double *z*)
- ArrayXcd [nl_polarization](#) (ArrayXd *E_t_*)
- ArrayXd [ionization_rate](#) (ArrayXd *E_t_*)
- ArrayXd [electron_density](#) (ArrayXd *W_t_*, double *z*)
- ArrayXcd [current_density](#) (ArrayXd *E_t_*, double *z*)

Public Attributes

- double [atom_density_max](#)
- double [z_max](#)
- double [inlet_1](#)
- double [inlet_2](#)
- double [transitionLength](#)
- double [U](#)
- double [C_kl](#)
- double [n_star](#)
- double [kappa](#)

Private Attributes

- [physics_textbook](#) [physics](#)
- [maths_textbook](#) [maths](#)
- [grid_tw](#) [tw](#)
- DFTI_DESCRIPTOR_HANDLE [ft](#)

3.8.1 Detailed Description

Originally created by Patrick Anderson. Modified by Samuel Senior on 10/03/2017. "keldysh_gas" contains the medium response model.

3.8.2 Constructor & Destructor Documentation

3.8.2.1 `keldysh_gas::keldysh_gas (double press_, grid_tw & tw_, DFTI_DESCRIPTOR_HANDLE & ft_, maths_textbook & maths_)`

Constructor

3.8.3 Member Function Documentation

3.8.3.1 `double keldysh_gas::atom_density (double z)`

3.8.3.2 `ArrayXcd keldysh_gas::current_density (ArrayXd E_t_, double z)`

Evaluate Current density for active frequencies

3.8.3.3 `ArrayXd keldysh_gas::electron_density (ArrayXd W_t_, double z)`

Calculate free electron density (solve rate equations)

3.8.3.4 `ArrayXd keldysh_gas::ionization_rate (ArrayXd E_t_)`

Calculate ionization rate (Popov, 2004)

3.8.3.5 ArrayXcd keldysh_gas::nl_polarization (ArrayXcd E_t)

Evaluate nonlinear polarization for active frequencies

3.8.4 Member Data Documentation

3.8.4.1 double keldysh_gas::atom_density_max

3.8.4.2 double keldysh_gas::C_kl

3.8.4.3 DFTI_DESCRIPTOR_HANDLE keldysh_gas::ft [private]

3.8.4.4 double keldysh_gas::inlet_1

3.8.4.5 double keldysh_gas::inlet_2

3.8.4.6 double keldysh_gas::kappa

3.8.4.7 maths_textbook keldysh_gas::maths [private]

3.8.4.8 double keldysh_gas::n_star

3.8.4.9 physics_textbook keldysh_gas::physics [private]

3.8.4.10 double keldysh_gas::transitionLength

3.8.4.11 grid_tw keldysh_gas::tw [private]

3.8.4.12 double keldysh_gas::U

3.8.4.13 double keldysh_gas::z_max

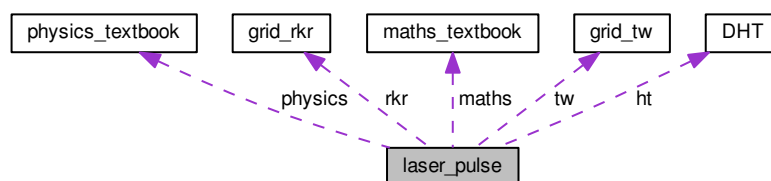
The documentation for this class was generated from the following files:

- [/home/sam/Project/XNLO/UPPE/src/keldysh_gas.hpp](#)
- [/home/sam/Project/XNLO/UPPE/src/keldysh_gas.cpp](#)

3.9 laser_pulse Class Reference

```
#include <laser_pulse.hpp>
```

Collaboration diagram for laser_pulse:



Public Member Functions

- [laser_pulse](#) (double [p_av_](#), double [rep_](#), double [fwhm_](#), double [l_0_](#), double [ceo_](#), double [waist_](#), [grid_tw](#) &[tw_](#), [grid_rkr](#) &[rkr_](#), DFTI_DESCRIPTOR_HANDLE &[ft_](#), [DHT](#) &[ht_](#), [maths_textbook](#) &[maths_](#))
- void [propagate](#) (double [dz_](#), [capillary_fibre](#) &[capillary_](#), [keldysh_gas](#) &[gas_](#))

Public Attributes

- ArrayXXcd [A_w_active](#)
- ArrayXXcd [P_NL_r_t](#)
- ArrayXXcd [P_NL_m_t](#)
- ArrayXXcd [P_NL_w](#)
- ArrayXXd [electron_density](#)
- double [atom_density_max](#)
- double [p_pk](#)
- double [E_pk](#)

Private Member Functions

- void [RK_F_45](#) (double [dz_](#), [capillary_fibre](#) &[capillary_](#), [keldysh_gas](#) &[gas_](#))
- ArrayXXcd [RHS_UPPE](#) (double [dz_](#), ArrayXXcd [A_w_active](#), [capillary_fibre](#) &[capillary_](#), [keldysh_gas](#) &[gas_](#))

Private Attributes

- [physics_textbook](#) [physics](#)
- [maths_textbook](#) [maths](#)
- [grid_tw](#) [tw](#)
- [grid_rkr](#) [rkr](#)
- DFTI_DESCRIPTOR_HANDLE [ft](#)
- [DHT](#) [ht](#)
- ArrayXXcd [Y_4](#)
- ArrayXXcd [Y_5](#)
- double [e](#)
- double [z_position](#)

3.9.1 Detailed Description

Originally created by Patrick Anderson. Modified by Samuel Senior on 10/03/2017. "laser_pulse" contains the active spectral amplitudes and governs their propagation over longitudinal step dz.

3.9.2 Constructor & Destructor Documentation

- 3.9.2.1 [laser_pulse::laser_pulse](#) (double [p_av_](#), double [rep_](#), double [fwhm_](#), double [l_0_](#), double [ceo_](#), double [waist_](#), [grid_tw](#) & [tw_](#), [grid_rkr](#) & [rkr_](#), DFTI_DESCRIPTOR_HANDLE & [ft_](#), [DHT](#) & [ht_](#), [maths_textbook](#) & [maths_](#))

Constructor

3.9.3 Member Function Documentation

3.9.3.1 void laser_pulse::propagate (double dz_, capillary_fibre & capillary_, keldysh_gas & gas_)

Propagate sprectral amplitudes A_w_active over the longitudinal step dz_, based on A. Couairon, et al., Eur. Phys. J. Special Topics, 199, 5 (2011)

3.9.3.2 ArrayXXcd laser_pulse::RHS_UPPE (double dz_, ArrayXXcd temp_1, capillary_fibre & capillary_, keldysh_gas & gas_) [private]

Evaluate RHS of UPPE

3.9.3.3 void laser_pulse::RK_F_45 (double h_, capillary_fibre & capillary_, keldysh_gas & gas_) [private]

Runge-Kutta-Fehlberg 45 ODE solver

3.9.4 Member Data Documentation

3.9.4.1 ArrayXXcd laser_pulse::A_w_active

Spectral amplitudes

3.9.4.2 double laser_pulse::atom_density_max

3.9.4.3 double laser_pulse::e [private]

Error in RKF45 solve

3.9.4.4 double laser_pulse::E_pk

3.9.4.5 ArrayXXd laser_pulse::electron_density

3.9.4.6 DFTI_DESCRIPTOR_HANDLE laser_pulse::ft [private]

Fourier transform

3.9.4.7 DHT laser_pulse::ht [private]

Hankel transform

3.9.4.8 maths_textbook laser_pulse::maths [private]

Mathematical constants and functions

3.9.4.9 `ArrayXXcd laser_pulse::P_NL_m_t`

3.9.4.10 `ArrayXXcd laser_pulse::P_NL_r_t`

3.9.4.11 `ArrayXXcd laser_pulse::P_NL_w`

3.9.4.12 `double laser_pulse::p_pk`

3.9.4.13 `physics_textbook laser_pulse::physics` `[private]`

Physical constants

3.9.4.14 `grid_rkr laser_pulse::rkr` `[private]`

Radial grid

3.9.4.15 `grid_tw laser_pulse::tw` `[private]`

Temperal grid

3.9.4.16 `ArrayXXcd laser_pulse::Y_4` `[private]`

RKF 4

3.9.4.17 `ArrayXXcd laser_pulse::Y_5` `[private]`

RKF 5

3.9.4.18 `double laser_pulse::z_position` `[private]`

The documentation for this class was generated from the following files:

- [/home/sam/Project/XNLO/UPPE/src/laser_pulse.hpp](#)
- [/home/sam/Project/XNLO/UPPE/src/laser_pulse.cpp](#)

3.10 maths_textbook Class Reference

```
#include <maths_textbook.hpp>
```

Public Member Functions

- [maths_textbook](#) (std::string path_input_j0_)
- double [trapz](#) (ArrayXd x_, ArrayXd y_)
- ArrayXd [cumtrapz](#) (ArrayXd x_, ArrayXd y_)

Public Attributes

- double [pi](#)
- ArrayXd [J0_zeros](#)

Private Attributes

- std::string [path_input_j0](#)

3.10.1 Detailed Description

Originally created by Patrick Anderson. Modified by Samuel Senior on 10/03/2017. "maths_textbook" is a container for mathematical constants and functions.

3.10.2 Constructor & Destructor Documentation

3.10.2.1 `maths_textbook::maths_textbook (std::string path_input_j0_)`

Constructor

3.10.3 Member Function Documentation

3.10.3.1 `ArrayXd maths_textbook::cumtrapz (ArrayXd x_, ArrayXd y_)`

Cumulative trapezoidal integration

3.10.3.2 `double maths_textbook::trapz (ArrayXd x_, ArrayXd y_)`

Trapezoidal integration

3.10.4 Member Data Documentation

3.10.4.1 `ArrayXd maths_textbook::J0_zeros`

3.10.4.2 `std::string maths_textbook::path_input_j0` [private]

3.10.4.3 `double maths_textbook::pi`

The documentation for this class was generated from the following files:

- /home/sam/Project/XNLO/UPPE/src/[maths_textbook.hpp](#)
- /home/sam/Project/XNLO/UPPE/src/[maths_textbook.cpp](#)

3.11 physics_textbook Class Reference

```
#include <physics_textbook.hpp>
```

Public Member Functions

- [physics_textbook](#) ()

Public Attributes

- double [E_at](#)
- double [l_at](#)
- double [m_at](#)
- double [q_at](#)
- double [t_at](#)
- double [w_at](#)
- double [c](#)
- double [eps_0](#)
- double [mu_0](#)
- double [h_bar](#)
- double [k_B](#)

3.11.1 Detailed Description

Modified by Patrick Anderson on 03/09/2015. "physics_textbook" is a container for physical constants.

3.11.2 Constructor & Destructor Documentation

3.11.2.1 physics_textbook::physics_textbook ()

Constructor

3.11.3 Member Data Documentation

3.11.3.1 double physics_textbook::c

Speed of light in vacuum

3.11.3.2 double physics_textbook::E_at

3.11.3.3 double physics_textbook::eps_0

Permittivity of free space

3.11.3.4 double physics_textbook::h_bar

Reduced Planck constant

3.11.3.5 double physics_textbook::k_B

Boltzmann Constant

3.11.3.6 double physics_textbook::l_at

Bohr radius

3.11.3.7 double physics_textbook::m_at

3.11.3.8 double physics_textbook::mu_0

Permeability of free space

3.11.3.9 double physics_textbook::q_at

Electron charge

3.11.3.10 double physics_textbook::t_at

3.11.3.11 double physics_textbook::w_at

The documentation for this class was generated from the following files:

- /home/sam/Project/XNLO/UPPE/src/[physics_textbook.hpp](#)
- /home/sam/Project/XNLO/UPPE/src/[physics_textbook.cpp](#)

Chapter 4

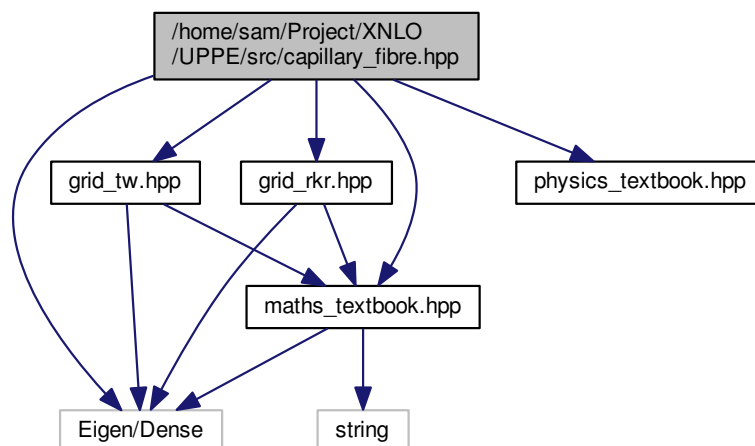
File Documentation

4.1 /home/sam/Project/XNLO/UPPE/src/capillary_fibre.cpp File Reference

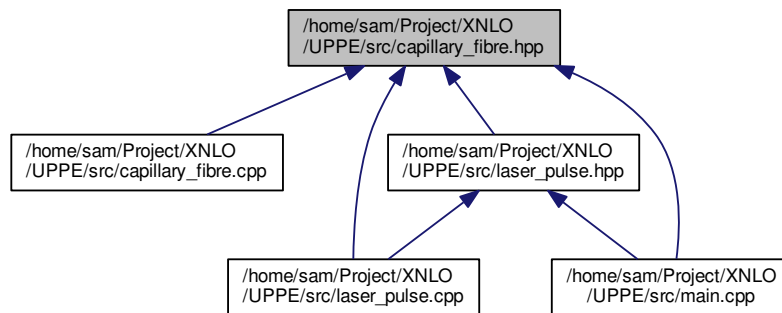
```
#include "capillary_fibre.hpp"  
#include "grid_rkr.hpp"  
#include "grid_tw.hpp"  
#include "physics_textbook.hpp"  
#include "maths_textbook.hpp"  
#include "Eigen/Dense"
```

4.2 /home/sam/Project/XNLO/UPPE/src/capillary_fibre.hpp File Reference

```
#include "Eigen/Dense"  
#include "grid_tw.hpp"  
#include "grid_rkr.hpp"  
#include "physics_textbook.hpp"  
#include "maths_textbook.hpp"  
Include dependency graph for capillary_fibre.hpp:
```



This graph shows which files directly or indirectly include this file:



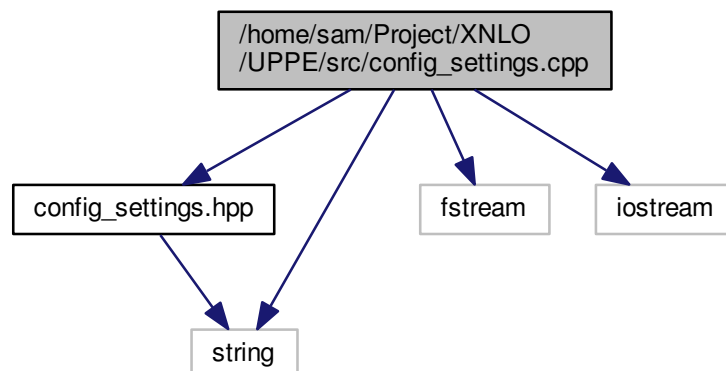
Classes

- class `capillary_fibre`

4.3 /home/sam/Project/XNLO/UPPE/src/config_settings.cpp File Reference

```
#include "config_settings.hpp"
#include <fstream>
#include <iostream>
#include <string>
```

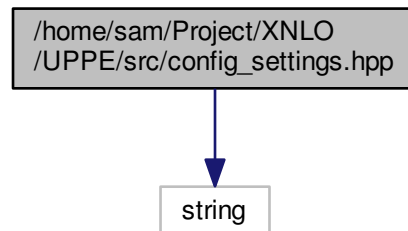
Include dependency graph for `config_settings.cpp`:



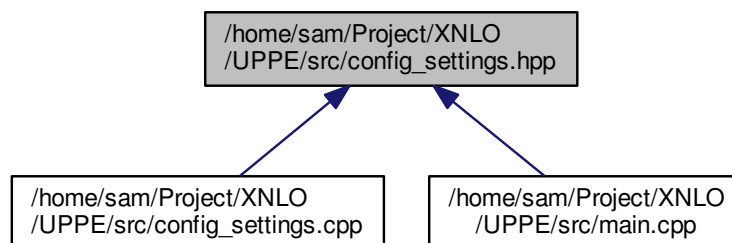
4.4 /home/sam/Project/XNLO/UPPE/src/config_settings.hpp File Reference

```
#include <string>
```

Include dependency graph for config_settings.hpp:



This graph shows which files directly or indirectly include this file:



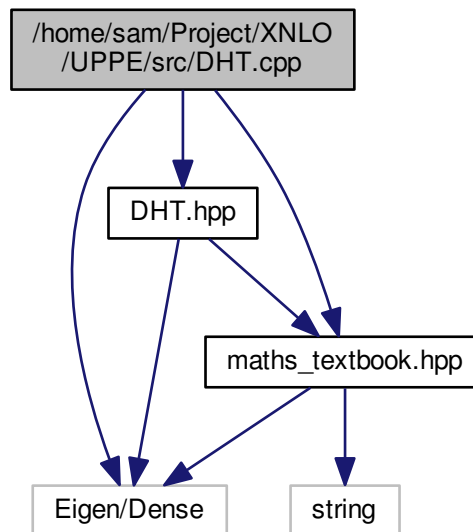
Classes

- class [Config_Settings](#)

4.5 /home/sam/Project/XNLO/UPPE/src/DHT.cpp File Reference

```
#include "DHT.hpp"  
#include "Eigen/Dense"  
#include "maths_textbook.hpp"
```

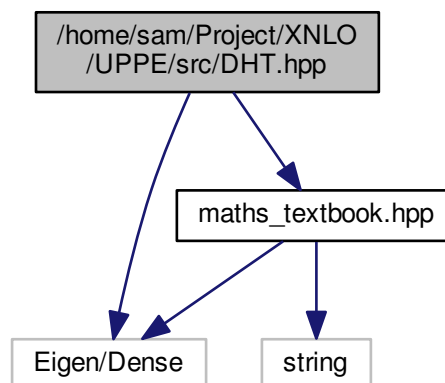
Include dependency graph for DHT.cpp:



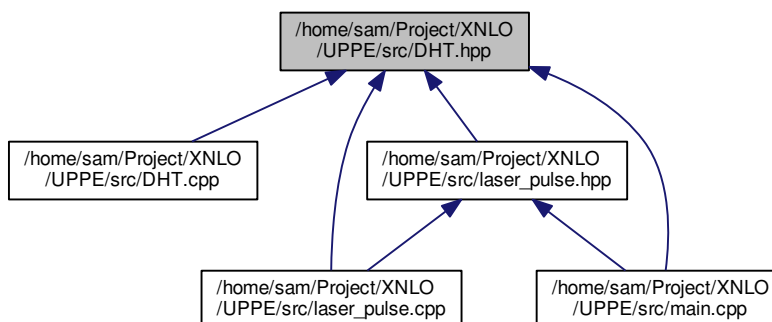
4.6 `/home/sam/Project/XNLO/UPPE/src/DHT.hpp` File Reference

```
#include "Eigen/Dense"  
#include "maths_textbook.hpp"
```

Include dependency graph for DHT.hpp:



This graph shows which files directly or indirectly include this file:

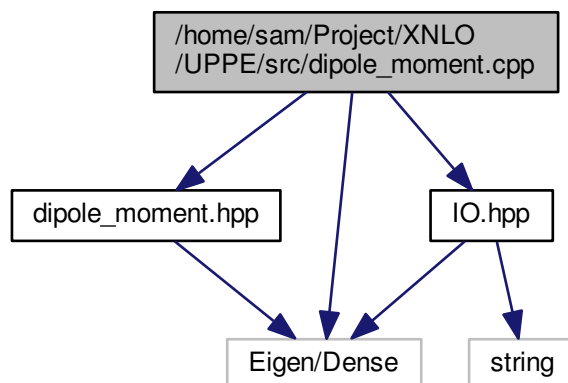


Classes

- class **DHT**

4.7 /home/sam/Project/XNLO/UPPE/src/dipole_moment.cpp File Reference

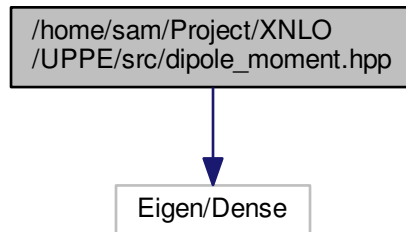
```
#include "dipole_moment.hpp"
#include "Eigen/Dense"
#include "IO.hpp"
Include dependency graph for dipole_moment.cpp:
```



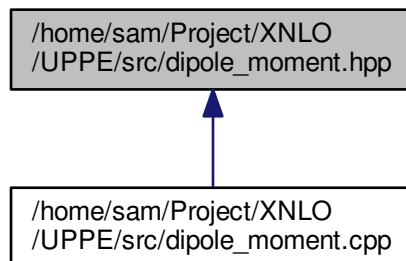
4.8 /home/sam/Project/XNLO/UPPE/src/dipole_moment.hpp File Reference

```
#include "Eigen/Dense"
```

Include dependency graph for dipole_moment.hpp:



This graph shows which files directly or indirectly include this file:



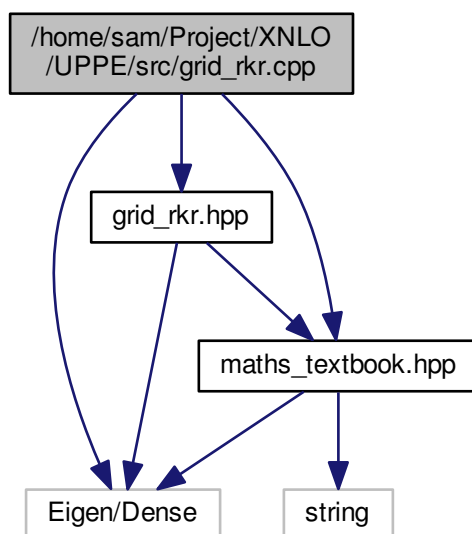
Classes

- class [Dipole_moment](#)

4.9 /home/sam/Project/XNLO/UPPE/src/grid_rkr.cpp File Reference

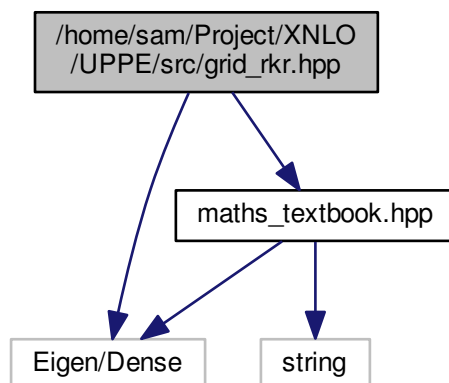
```
#include "grid_rkr.hpp"
#include "maths_textbook.hpp"
#include "Eigen/Dense"
```

Include dependency graph for grid_rkr.cpp:

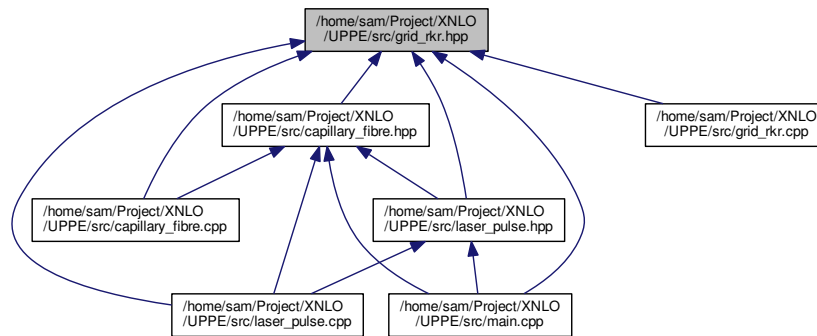


4.10 /home/sam/Project/XNLO/UPPE/src/grid_rkr.hpp File Reference

```
#include "Eigen/Dense"
#include "maths_textbook.hpp"
Include dependency graph for grid_rkr.hpp:
```



This graph shows which files directly or indirectly include this file:



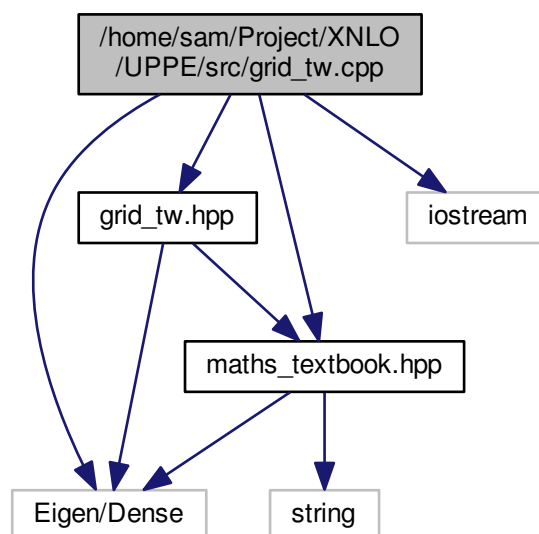
Classes

- class `grid_rkr`

4.11 /home/sam/Project/XNLO/UPPE/src/grid_tw.cpp File Reference

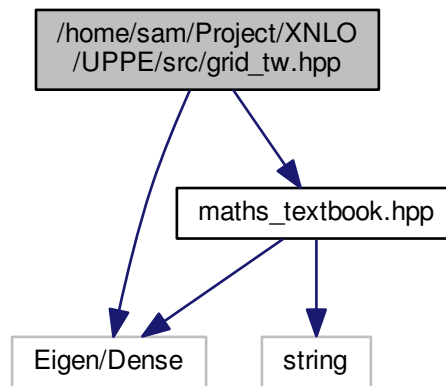
```
#include "grid_tw.hpp"
#include "maths_textbook.hpp"
#include "Eigen/Dense"
#include <iostream>
```

Include dependency graph for `grid_tw.cpp`:

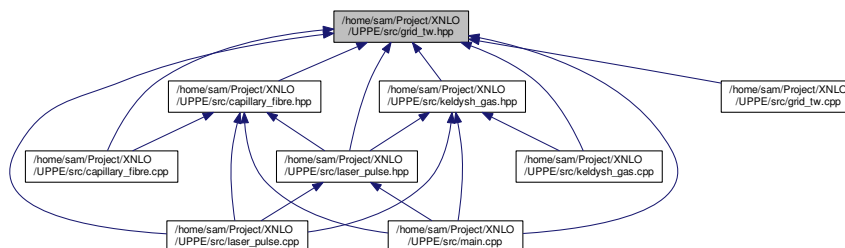


4.12 /home/sam/Project/XNLO/UPPE/src/grid_tw.hpp File Reference

```
#include "Eigen/Dense"
#include "maths_textbook.hpp"
Include dependency graph for grid_tw.hpp:
```



This graph shows which files directly or indirectly include this file:



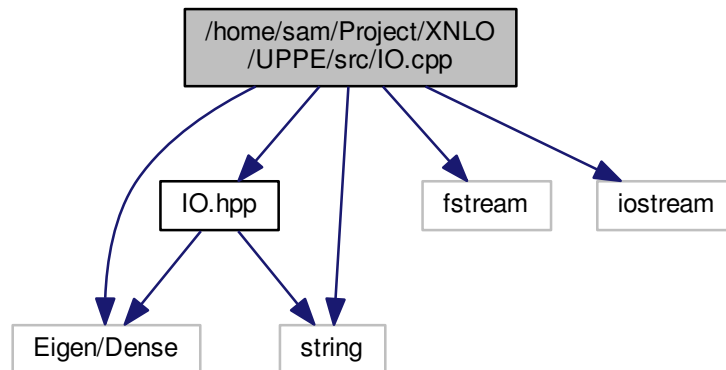
Classes

- class `grid_tw`

4.13 /home/sam/Project/XNLO/UPPE/src/IO.cpp File Reference

```
#include "IO.hpp"
#include "Eigen/Dense"
#include <fstream>
#include <iostream>
#include <string>
```

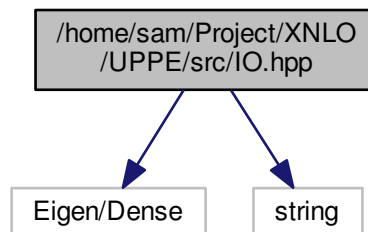
Include dependency graph for IO.cpp:



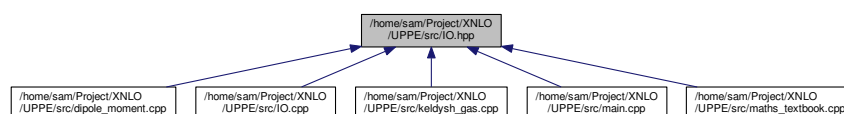
4.14 /home/sam/Project/XNLO/UPPE/src/IO.hpp File Reference

```
#include "Eigen/Dense"
#include <string>
```

Include dependency graph for IO.hpp:



This graph shows which files directly or indirectly include this file:



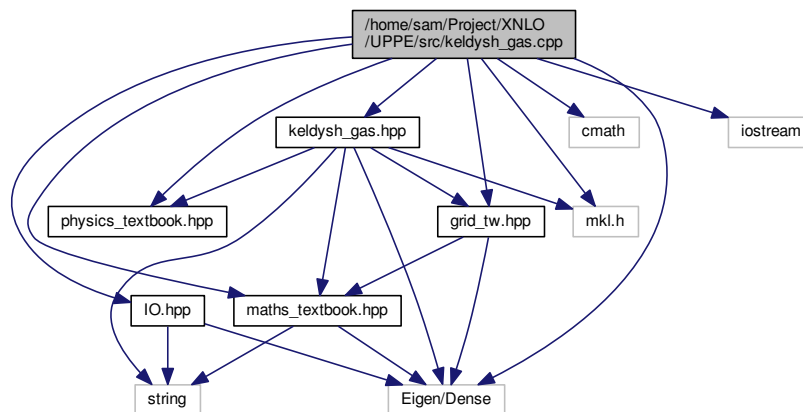
Classes

- class [IO](#)

4.15 /home/sam/Project/XNLO/UPPE/src/keldysh_gas.cpp File Reference

```
#include "keldysh_gas.hpp"
#include "physics_textbook.hpp"
#include "grid_tw.hpp"
#include <mkl.h>
#include "Eigen/Dense"
#include "maths_textbook.hpp"
#include <cmath>
#include "IO.hpp"
#include <iostream>
```

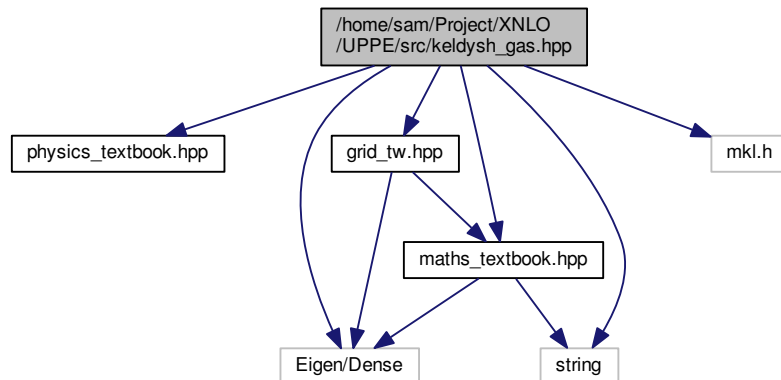
Include dependency graph for keldysh_gas.cpp:



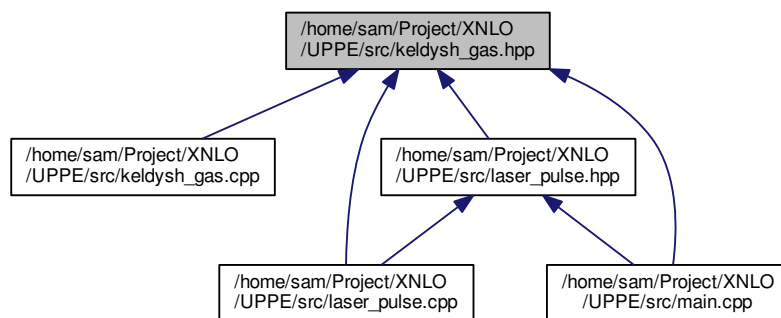
4.16 /home/sam/Project/XNLO/UPPE/src/keldysh_gas.hpp File Reference

```
#include "physics_textbook.hpp"
#include "maths_textbook.hpp"
#include "grid_tw.hpp"
#include <mkl.h>
#include "Eigen/Dense"
#include <string>
```

Include dependency graph for keldysh_gas.hpp:



This graph shows which files directly or indirectly include this file:



Classes

- class [keldysh_gas](#)

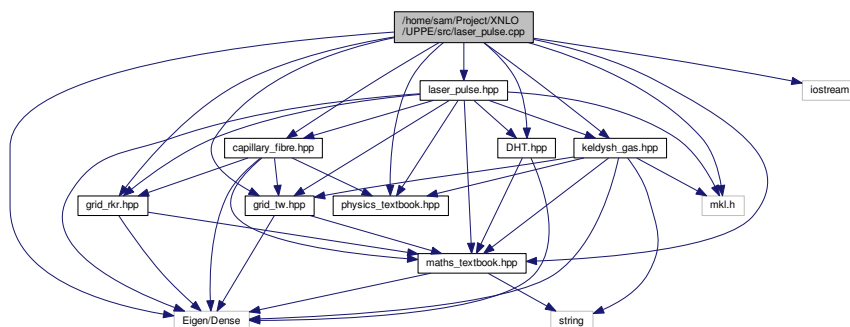
4.17 /home/sam/Project/XNLO/UPPE/src/laser_pulse.cpp File Reference

```

#include "laser_pulse.hpp"
#include "grid_tw.hpp"
#include "grid_rkr.hpp"
#include <mkl.h>
#include "DHT.hpp"
#include "physics_textbook.hpp"
#include "maths_textbook.hpp"
#include "Eigen/Dense"
#include "capillary_fibre.hpp"
#include "keldysh_gas.hpp"
#include <iostream>

```

Include dependency graph for laser_pulse.cpp:



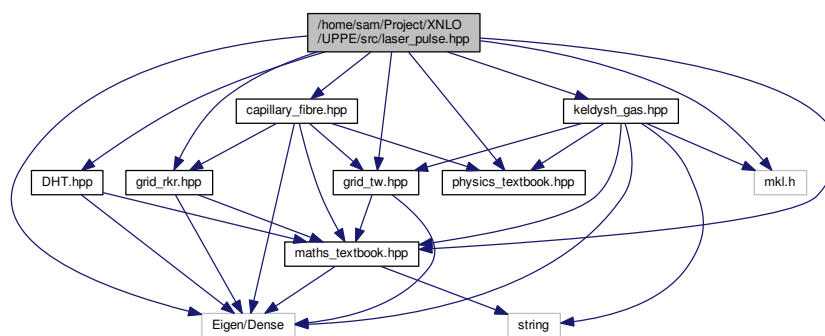
4.18 /home/sam/Project/XNLO/UPPE/src/laser_pulse.hpp File Reference

```

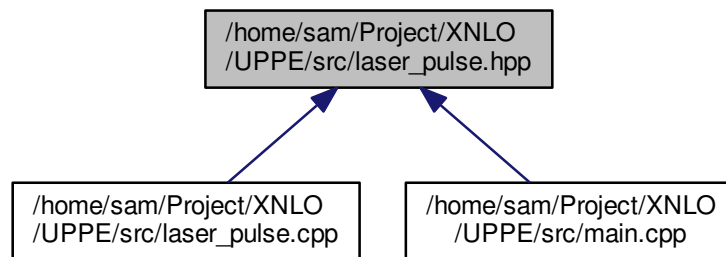
#include "physics_textbook.hpp"
#include "maths_textbook.hpp"
#include "grid_tw.hpp"
#include "grid_rkr.hpp"
#include <mkl.h>
#include "DHT.hpp"
#include "Eigen/Dense"
#include "capillary_fibre.hpp"
#include "keldysh_gas.hpp"

```

Include dependency graph for laser_pulse.hpp:



This graph shows which files directly or indirectly include this file:



Classes

- class [laser_pulse](#)

4.19 /home/sam/Project/XNLO/UPPE/src/main.cpp File Reference

```

#include <mpi.h>
#include "maths_textbook.hpp"
#include "physics_textbook.hpp"
#include <mkl.h>
#include "DHT.hpp"
#include "grid_rkr.hpp"
#include "grid_tw.hpp"
#include "laser_pulse.hpp"
#include "capillary_fibre.hpp"
#include "keldysh_gas.hpp"
#include "Eigen/Dense"
#include "IO.hpp"
#include "config_settings.hpp"
#include <iostream>
#include <string>
#include "../XNLO/lib/XNLO.hpp"

```

Functions

- int [main](#) (int argc, char **argv)

4.19.1 Function Documentation

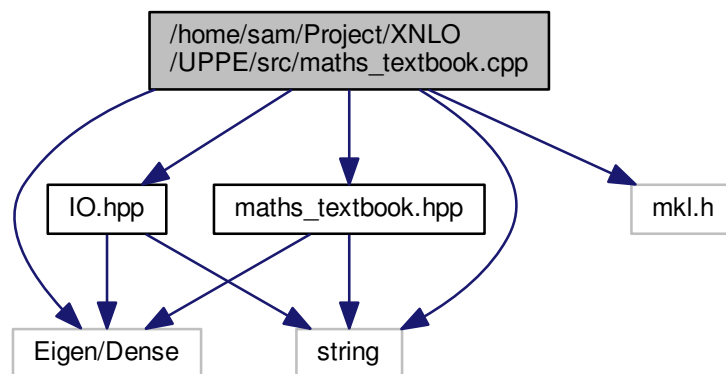
4.19.1.1 int main (int argc, char ** argv)

Originally created by Patrick Anderson. Modified by Samuel Senior on 10/03/2017. Test enviroment for UPPE codes.

4.20 /home/sam/Project/XNLO/UPPE/src/maths_textbook.cpp File Reference

```
#include "maths_textbook.hpp"  
#include "IO.hpp"  
#include "Eigen/Dense"  
#include <mkl.h>  
#include <string>
```

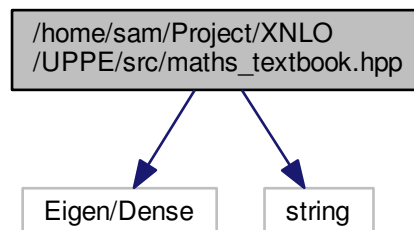
Include dependency graph for maths_textbook.cpp:



4.21 /home/sam/Project/XNLO/UPPE/src/maths_textbook.hpp File Reference

```
#include "Eigen/Dense"  
#include <string>
```

Include dependency graph for maths_textbook.hpp:



Classes

- class [physics_textbook](#)

4.24 /home/sam/Project/XNLO/UPPE/src/version.hpp File Reference

Macros

- #define [_VERSION_MAJOR](#) 1
- #define [_VERSION_MINOR](#) 3
- #define [_VERSION_SUBMINOR](#) 0

4.24.1 Macro Definition Documentation

4.24.1.1 #define [_VERSION_MAJOR](#) 1

4.24.1.2 #define [_VERSION_MINOR](#) 3

4.24.1.3 #define [_VERSION_SUBMINOR](#) 0

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