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**Optcom**  
*Release 0.2.0*

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We are glad that you are interested in Optcom's source code which you can find in the [github repo](#) .



## TUTORIALS

The tutorials are available in the [github repo](#) in the directory *tutorials/*.





## MODULES DESCRIPTION

This document will drive you through the architecture of Optcom.

### 2.1 Simulation Framework

The Layout, Domain, Field and Component are the building blocks of Optcom's optical system simulation framework.

#### 2.1.1 Field

Fields represent an electric or optical signal. The object Field can contain multiple channels and save the values of the electro-magnetic field envelopes as well as other physic's characteristics. Moreover, a variety of helper functions are available for Field objects.

#### 2.1.2 Component

Components represent electric or optical physical block such as laser, fiber and so on. There are two types of components in Optcom. First, *StartComp* which create a Field object and can launch the simulation. Second, *PassComp* which receive Field objects, transform it, and pass it along to the next component. A component is composed of ports.

#### 2.1.3 Domain

The domain contains information, i.e. physic's parameters, that will be shared by all components.

#### 2.1.4 Layout

A Layout allows to build a system by connecting the components to each other via their ports. Moreover, the Layout is managing the propagation of the Domain and Fields through the system.

## 2.2 Simulation Tools

### 2.2.1 Constraints

The Constraint objects represent constraints that the layout must comply with while propagating Field objects in the Layout.

### 2.2.2 Effects

The Effect object represents electric / optical effect that can be used to define equations.

### 2.2.3 Equations

The Equation object is used to define equations that need a numerical solver and which describe the Field object transformation in a component.

### 2.2.4 Parameters

The Parameter object is a standalone object which can be used as a helper object. It describes a physics parameter such as the refractive index.

### 2.2.5 Solvers

The solver object is used to numerically solve the Equation objects.

## 3.1 optcom package

### 3.1.1 Subpackages

optcom.components package

Submodules

optcom.components.abstract\_component module

optcom.components.abstract\_fiber\_amp module

optcom.components.abstract\_fiber\_amp\_2levels module

optcom.components.abstract\_pass\_comp module

optcom.components.abstract\_start\_comp module

optcom.components.cw module

optcom.components.fiber module

optcom.components.fiber\_coupler module

optcom.components.fiber\_yb module

optcom.components.gaussian module

optcom.components.gaussian\_filter module

optcom.components.ideal\_amplifier module

optcom.components.ideal\_combiner module

optcom.components.ideal\_coupler module

optcom.components.ideal\_divider module

optcom.components.ideal\_isolator module

optcom.components.ideal\_mzm module

optcom.components.ideal\_phase\_mod module

optcom.components.load\_field module

optcom.components.load\_field\_from\_file module

optcom.components.port module

optcom.components.save\_field module

optcom.components.save\_field\_to\_file module

optcom.components.sech module

optcom.components.soliton module

#### Module contents

optcom.constraints package

#### Submodules

optcom.constraints.abstract\_constraint module

optcom.constraints.constraint\_coprop module

optcom.constraints.constraint\_max\_pass\_port module

optcom.constraints.constraint\_port\_in module

optcom.constraints.constraint\_port\_valid module

optcom.constraints.constraint\_waiting module

#### Module contents

optcom.effects package

## Submodules

`optcom.effects.absorption` module

`optcom.effects.abstract_effect` module

`optcom.effects.abstract_effect_taylor` module

`optcom.effects.active_fiber_photon_process` module

`optcom.effects.asymmetry` module

`optcom.effects.attenuation` module

`optcom.effects.coupling` module

`optcom.effects.dispersion` module

`optcom.effects.emission` module

`optcom.effects.gain` module

`optcom.effects.gain_saturation` module

`optcom.effects.kerr` module

`optcom.effects.pump` module

`optcom.effects.raman` module

`optcom.effects.raman_approx` module

`optcom.effects.relaxation` module

`optcom.effects.self_steepening` module

`optcom.effects.self_steepening_approx` module

## Module contents

`optcom.equations` package

## Subpackages

`optcom.equations.boundary_conditions` package

### Submodules

optcom.equations.boundary\_conditions.abstract\_boundary\_conditions module

optcom.equations.boundary\_conditions.boundary\_conditions\_ampnlse module

### Module contents

optcom.equations.convergence\_checker package

### Submodules

optcom.equations.convergence\_checker.abstract\_convergence\_checker module

optcom.equations.convergence\_checker.convergence\_checker\_consecutive module

### Module contents

### Submodules

optcom.equations.abstract\_ampnlse module

optcom.equations.abstract\_cnlse module

optcom.equations.abstract\_equation module

optcom.equations.abstract\_field\_equation module

optcom.equations.abstract\_nlse module

optcom.equations.abstract\_re module

optcom.equations.abstract\_re\_fiber module

optcom.equations.ampanlse module

optcom.equations.ampgnlse module

optcom.equations.amphnlse module

optcom.equations.anlse module

optcom.equations.ase\_noise module

optcom.equations.canlse module

**optcom.equations.cgnlse module**

**optcom.equations.cnlse module**

**optcom.equations.coupler\_noise module**

**optcom.equations.fresnel module**

**optcom.equations.gnlse module**

**optcom.equations.mccumber module**

**optcom.equations.nlse module**

**optcom.equations.re\_fiber\_2levels module**

**optcom.equations.re\_fiber\_yb module**

**optcom.equations.re\_yb module**

**Module contents**

**optcom.parameters package**

**Subpackages**

**optcom.parameters.dispersion package**

**Submodules**

**optcom.parameters.dispersion.chromatic\_disp module**

**Module contents**

**optcom.parameters.fiber package**

**Submodules**

**optcom.parameters.fiber.absorption\_section module**

**optcom.parameters.fiber.asymmetry\_coeff module**

**optcom.parameters.fiber.coupling\_coeff module**

**optcom.parameters.fiber.doped\_fiber\_gain module**

optcom.parameters.fiber.effective\_area module

optcom.parameters.fiber.emission\_section module

optcom.parameters.fiber.energy\_saturation module

optcom.parameters.fiber.fiber\_recovery\_time module

optcom.parameters.fiber.nl\_coefficient module

optcom.parameters.fiber.nl\_phase\_shift module

optcom.parameters.fiber.numerical\_aperture module

optcom.parameters.fiber.overlap\_factor module

optcom.parameters.fiber.raman\_response module

optcom.parameters.fiber.se\_power module

optcom.parameters.fiber.v\_number module

Module contents

optcom.parameters.refractive\_index package

Submodules

optcom.parameters.refractive\_index.nl\_index module

optcom.parameters.refractive\_index.resonant\_index module

optcom.parameters.refractive\_index.sellmeier module

Module contents

Submodules

optcom.parameters.abstract\_parameter module

Module contents

optcom.solvers package

Submodules



`optcom.solvers.abstract_solver` module

`optcom.solvers.field_stepper` module

`optcom.solvers.gradient` module

`optcom.solvers.jacobian` module

`optcom.solvers.nlse_solver` module

`optcom.solvers.ode_solver` module

`optcom.solvers.root` module

Module contents

`optcom.utils` package

Subpackages

`optcom.utils.constant_values` package

Submodules

`optcom.utils.constant_values.domain_cst` module

`optcom.utils.constant_values.fiber_cst` module

`optcom.utils.constant_values.field_types` module

`optcom.utils.constant_values.physic_cst` module

`optcom.utils.constant_values.port_types` module

`optcom.utils.constant_values.solver_cst` module

Module contents

`optcom.utils.utilities_helpers` package

Submodules

`optcom.utils.utilities_helpers.array_helpers` module

`optcom.utils.utilities_helpers.attr_helpers` module

`optcom.utils.utilities_helpers.component_helpers` module

`optcom.utils.utilities_helpers.data_helpers` module

`optcom.utils.utilities_helpers.list_helpers` module

`optcom.utils.utilities_helpers.physics_helpers` module

`optcom.utils.utilities_helpers.terminal_display_helpers` module

**Module contents**

**Submodules**

`optcom.utils.callable_container` module

`optcom.utils.callable_litt_expr` module

`optcom.utils.constants` module

`optcom.utils.cont_array` module

`optcom.utils.csv_fit` module

`optcom.utils.fft` module

`optcom.utils.id_tracker` module

`optcom.utils.plot` module

`optcom.utils.storage` module

`optcom.utils.synchroniser` module

`optcom.utils.taylor` module

`optcom.utils.utilities` module

**Module contents**

**3.1.2 Submodules**

**3.1.3 optcom.config module**

**3.1.4 optcom.domain module**

**3.1.5 optcom.field module**

**3.1.6 optcom.layout module**

**3.1.7 Module contents**



## INDICES AND TABLES

- genindex
- modindex
- search