COMSOL optical module optomechanical thermal coupling



Overview

With the COMSOL Multiphysics ® software, you can combine structural, thermal, and optical effects in a single model, so that rays are traced in the thermal-stress-induced deformed geometry while the built-in material models account for temperature-dependence of the refractive. With the COMSOL Multiphysics ® software, you can combine structural, thermal, and optical effects in a single model, so that rays are traced in the thermal-stress-induced deformed geometry while the built-in material models account for temperature-dependence of the refractive. The Ray Optics Module is an add-on to the COMSOL Multiphysics ® software that allows you to model electromagnetic wave propagation with a ray-tracing approach. The propagating waves are treated as rays that can be reflected, refracted, or absorbed. This treatment of electromagnetic radiation uses. Tutorial on how to simulate optomechanical coupling in photonic crystal cavities in COMSOL. By coupling geometric optics, solid mechanics, and solid heat transfer and conducting parametric temperature scanning, a multiphysics simulation of the. Optomechanical (OM) cavities simultaneously localize photons and phonons, thus enhancing their mutual interaction through radiation-pressure force. The aforesaid frequency shift. For users of the Ray Optics Module, COMSOL Multiphysics ® version 6. 0 features a significantly improved and updated Optical material library in which structural and thermal properties are listed alongside optical dispersion coefficients and internal transmittance data for more than 500 optical. This guide describes the Wave Optics Module, an optional add-on package for COMSOL Multiphysics® designed to assist you to set-up and solve electromagnetic wave problems at optical frequencies.

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Article Content

COMSOL simulation tutorial: Optomechanical Coupling in ...

Tutorial on how to simulate optomechanical coupling in photonic crystal cavities in COMSOL.This content is presented at FEM workshop organized by EPFL in OMT...

Multiphysics Coupling Simulation of Off-Axis Integrated Cavity Optical ...

The optical properties of an off-axis integrated cavity system are influenced by both structural deformation and thermal deformation. In this paper, the finite element simulation and

Influence of thermal effects on the optomechanical coupling rate in ...

In this work, we introduce a theoretical approach to determine how thermal effects change the canonical OM coupling rate. To test the model, a complete set of optical-thermal-mechanical

Ray Optics Module Updates

With the inclusion of more comprehensive material data for optical glasses, it is now easier than ever to set up coupled structural-thermal-optical performance

Fibre Optical Coupler Simulation by Comsol

The paper presents a simulation model developed for a special optical coupler intended for coupling radiation from signal and pump sources used for

The Wave Optics Module User s Guide

This guide describes the Wave Optics Module, an optional add-on package for COMSOL Multiphysics® designed to assist you to set-up and solve electromagnetic wave problems at optical frequencies.

Fiber to resonator coupling multicriteria optimization with COMSOL ...

In this paper, we discuss the principle of coupling an optical signal to an optical resonator. We give the broad outlines of the principle and the experimental parameters then we look at how to optimize this

Accurate modeling and characterization of photothermal forces in ...

The goal of this simulation is obtaining parameters that only depend on approximately isotropic properties of GaAs, i.e. the linear and nonlinear thermal resistances, thermal lifetimes, and thermo

Multi-physical Field Coupling Simulation of Off-axis Four-mirror ...

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In this study, a multi-physical field coupling modeling method based on the COMSOL multiphysics finite element analysis software, coupled with heat transfer, solid mechanics, and geometric optics, is

Three-Dimensional Opto-Electro-Thermal Coupled Modeling of

In nanoscale PSCs, direct measurement of internal temperature and heat flux density is challenging, making thermal simulation an essential tool to explore heat generation and distribution

Built-in Multiphysics Couplings for Semiconductor Devices

In Part 6 of this course on semiconductor modeling, we discuss some additional multiphysics couplings. The optoelectronics coupling between the Semiconductor and electromagnetic waves interfaces take

Modeling Software for Ray Tracing in Optically Large

Product Suite Ray Optics Module Ray Optics Module Simulate Ray Tracing in Optically Large Systems The Ray Optics Module is an add-on to the COMSOL

The Opto-Mechanical–Thermal Coupling Analysis and

The opto-mechanical–thermal coupling analysis of the FIT at −20 °C was carried out, including data processing and coordinate transformation.

Thermo-mechanical-optical coupling within a digital twin development ...

Preliminary thermal and optical simulations are presented, along with different concepts for cooling of the system. Additionally, current barriers of the direct coupling of thermo-mechanical and

Introduction to Thermomechanical Modeling in COMSOL

In this archived webinar, we go over how to study thermal expansion, phase change, and thermal creep in a thermomechanical model. The presentation also includes a demonstration that shows you how

Numerical Investigation of the Opto-Electric and

Using COMSOL Multiphysics, a bidirectional study based on the coupling of the “heat transfer in solids” to the “geometrical optics module” will be

Modeling Thermally Induced Focal Shift in High

Need to model thermally induced focal shift in high-powered laser focusing systems? We explain how to do this with the Ray Optics Module.

Simulation of Thermomechanical Couplings of

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Using COMSOL Multiphysics® software, a new model was implemented with the Physics Builder functionality, which provides a thermomechanical coupling. It

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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