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Nonlinear Fiber Coupler



Overview

Each coupler has a characteristic portrait, revealing its unique physics. We believe that this approach is novel to all branches of nonlinear theory. Full details are given for nonlinear couplers with cores composed of different materials, Kerr law being a special case. A simple qualitative description of nonlinear couplers is presented whereby the maximum and minimum values of core power are immediately apparent from a graphical representation, here called the power flow portrait. 70, 2395 – Published 19 April, 1993 DOI: https://doi. However, when a MCF is considered as a medium for SDM transmiss on, the linear coupling between the MCF cores is a key feature to be considered and analyzed. Journal of Lightwave Technology, 2023, 41 (14), pp. ⟨hal-04411280⟩ HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific re-search documents, whether. This work predicts the soliton dynamics and parameter discovery for the coupled nonlinear Schrödinger equations in asymmetric fiber couplers. Using exact one- and two-soliton solutions derived from Hirota's bilinear method, an extended physics-informed neural networks approach is proposed. This. Multi-core fibers (MCFs), through the technique of space-division multiplexing

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(SDM), are the new type of fibers that promise to overcome the critical transmission capacity barriers and boost the capability of optical fiber communication (OFC) systems.

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Here, we validate these predictions in an optics context using a mode-locked fibre laser. We confirm that the coupling is universal and approximately satisfies a general scaling law.



Full details are given for nonlinear couplers with cores composed of different materials, Kerr law being a special case only. The study is motivated from the familiar perspective of linear couplers and is ...



We have demonstrated the feasibility of fiber-to-fiber nonlinear coupling in a simple coaxial arrangement of telecom single-mode fibers separated by a gap filled with NLC.



This work predicts the soliton dynamics and parameter discovery for the coupled nonlinear Schrödinger equations in asymmetric fiber couplers. Using exact one- and two-soliton solutions ...



Fiber couplers or nonlinear fiber couplers or directional couplers possess more than one single-mode optical fibers placed parallel to each other with an inter-fiber separation of the order of the excitation ...

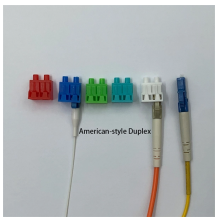
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Abstract: We report the design, fabrication and characterization of the first hollow core double-clad fiber coupler for nonlinear micro-endoscopy. It is made of a pure silica negative curvature hollow core ...



We find and analyze analytically and numerically two new families of coupled soliton states in nonlinear fiber couplers. The bifurcation diagram for the new types of soliton states is ...



ended to a NLDFC, as the simplest MCF coupler, described as a collection of two coupled SCFs. In this sense, a NLDFC is used to study the impact of the linear coupling on the nonlinear mechanism



Nonlinear directional fiber couplers (NLDFCs) serve as a simplified model for analyzing MCFs'' nonlinear dynamics. The study explores the reduction of nonlinear phase noise due to linear ...



The experimental and numerical results reveal that the asymmetry improves the switching performance of the nonlinear couplers based on DCFs, in the cases of both self-switching of near-IR femtosecond ...

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