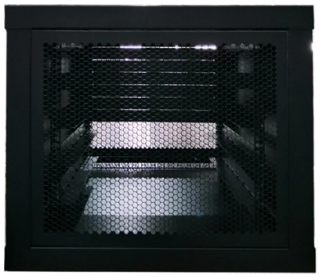
Vortex Effect of Optical Cables



Overview

Vortex-induced vibration is the resonant, small-amplitude vibration caused by steady, low-velocity wind blowing across cables under mechanical tension. The results show that in the submarine cable, there appears to be a beating vibration and locking phenomena respectively. Under the current scouring, submarine cables are prone to be exposed, suspended, and even vortex-induced vibration (VIV), threatening their mechanical and electrical proper-ties. In this contribution, a finite element simulation model of 110-kV single-core optical fibre composite submarine cable is. Section 2 gives a very brief introduction of the two embodiments of the state-of-polarization (SOP) scrambling analysis (SSA) method, while section 3 presents polarimetric measurement results and compares the polarization oscillation frequencies with the characteristics signatures identified in. Generation and transmission of optical vortex beam in all-fiber optical system Hue Thi Nguyen, Grzegorz Stepniewski, Adam Filipkowski, Rafal Kasztelanic, Dariusz Pysz, Hieu Van Le, Ryszard Stepien, Mariusz Klimczak, Wieslaw Krolikowski, and Ryszard Buczynski H.

Article Content

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Evaluation on aero-optical transmission effects caused by a vortex in ...

The results and analysis presented above indicate that variation in the vortex size is of critical significance for aero-optical transmission effects of the beam passing through a vortex, the

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Numerical investigation on vortex-induced vibration of vertically ...

VIV of the vertically suspended cables are investigated under exponential shear flow conditions. Vibration frequency and trajectory of the cables are analyzed under different reduced

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Fluid–structure interaction simulation and optical fibre stress ...

Graphical Abstract Fluid–structure interaction modelling approach of submarine cable and vortex-induced vibration simulations for suspended submarine cable. Comprehensive analysis of the

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(PDF) Torsional Optical Fiber Stress Analysis and

Due to current scouring, submarine cables are prone to be exposed, suspended, and even vortex-induced vibration, which is not conducive to the safe

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Fluid–structure interaction simulation and optical fibre stress ...

Abstract Under the current scouring, submarine cables are prone to be exposed, suspended, and even vortex-induced vibration (VIV), threatening their mechanical and electrical proper-ties. In this

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Vortex memory effect of light for scattering-assisted massive data ...

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Generation and transmission of optical vortex beam in all-fiber optical ...

We present an experimental study on generation and transmission of optical vortex in an all-fiber system consisting of an antiresonant fiber butt-coupled with a dedicated fiber-based vortex generator.

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A study on vortex-induced vibration of a long flexible

Vortex-induced vibration of a curved flexible cylinder placed in the test section of a recirculating water tunnel and fixed at both ends is studied

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Optical Vortices: Generation and Detection

An optical vortex, as one of the most prominent candidates for structured light, is typically identified as a phase or polarization singularity,

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Experimental study of vortex-induced vibration of stay cables installed ...

Abstract To address both illumination issues and the common vortex-induced vibration (VIV) of bridge cables, a perforated shroud light device is proposed. The effect of the different

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Optical vortices 30 years on: OAM manipulation from ...

Commemorating the 30th anniversary of the prediction of optical vortices by theoretical physicist Pierre Coullet and colleagues, researchers in China review the development of

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Three-dimensional numerical simulation of vortex-induced vibration of

The detailed flow field information provided by numerical simulation indicates that the size of the vortex structures gradually increases with the velocity, and the shape of the vortex structure

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Case Study: PMD Measurement on Aerial Fiber under Wind-Induced

Vortex-induced vibration occurs under sustained, low-velocity winds and cause optical cable to resonate at frequencies up to 150 Hz depending on the specifics of the installation.

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Multiple scales perturbation analysis on vortex-induced ...

Vortex-induced vibration (VIV) of large-span cables has become a significant engineering problem to be solved. As a typical continuous body with quadratic and cubic nonlinearity, the modal

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The Hall Effects of Vortex Light in Optical Materials

For light, its spin can be independent of the spatial distribution of its wave function, whereas its intrinsic orbital angular momentum does depend on this distribution. This difference suggests that

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Propagation characteristics of optical vortex pulse in atmospheric ...

Optical vortex is one kind of special optical field with spiral wavefront structure and definite orbital angular momentum [, ,]. Because of its unique characteristics, vortex beam has great

Dec 04, 2025

Simulation analysis of flow field and vortex-induced vibration ...

In this paper, a two-dimensional spring-damping vortex vibration model is established considering the effect of transverse flow and in-line flow. The vortex-induced vibration response of

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Observation of vortex-pair dance and oscillation

VPBs have gained increasing attention due to their unique properties, including vortex attraction and repulsion. Here, we explore the dynamics of pure

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Vortex Induced Vibration Analysis of 500kV Single-Core Optical Fiber ...

Under the action of wave force, the vortex induced vibration will exist in submarine power cable exposed in the sea flow. In order to understand its change rule.

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Optical vortex

An optical vortex (also known as a photonic quantum vortex, screw dislocation or phase singularity) is a zero of an optical field; a point of zero intensity. The term is

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Torsional Optical Fiber Stress Analysis and Vortex

To investigate the stress distribution and its development law of the torsional optical fiber during vortex-induced vibration in the submarine cable, the

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Moreover, the vortex-induced vibration range can be determined by the maximum stress change location. Optical fiber composite submarine cables.

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Design of a microstructure optical fiber supporting 52 vortex beams ...

To increase the number of vortex beams supported, we try to design a new type of fiber to transmit as many vortex beams as possible. Compared with conventional optical fibers,

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