

Title (en)
DEVICE AND METHOD FOR TRANSPORTING PULSED LASER RADIATION USING A HOLLOW-CORE OPTICAL FIBER

Title (de)
VORRICHTUNG UND VERFAHREN ZUM TRANSPORT VON GEPULSTER LASER-STRAHLUNG MIT EINER HOHLKERNLICHTLEITFASER

Title (fr)
DISPOSITIF ET PROCÉDÉ DE TRANSPORT D'UN RAYONNEMENT LASER PULSÉ À L'AIDE D'UNE FIBRE OPTIQUE À ÂME CREUSE

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Application
EP 20789589 A 20201009

Priority

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Abstract (en)
[origin: WO2021069716A1] The invention relates to a device (11) for transporting pulsed laser radiation with a pulse energy which leads to highly intensive laser pulses (3C) with a compressed pulse duration. The device comprises a pulse duration setting device (13), a hollow-core optical fiber (1), and a fiber coupling device (17). The pulse duration setting device (13) is designed to receive the pulsed laser radiation and set the transport pulse duration (Δt_t) of the laser radiation. The hollow-core optical fiber (1) has a hollow core (4A) surrounded by a material (4B), and the hollow-core optical fiber (1) transports laser pulses (3B), which are coupled at a first fiber end (1A), in the hollow core (4A) to a second fiber end (1B) and decouples the laser pulses there. The invention proposes an operation of the hollow-core optical fiber (1) with beam path parameter values (X, α) at the first fiber end (1A), said values lying in a target tolerance range (ΔX_S). The fiber coupling device (17) is designed to receive laser radiation set to the transport pulse duration (Δt_t) and couple said radiation into the hollow-core optical fiber (1) with the beam path parameter values (X, α) which lie in the target tolerance range (ΔX_S). The transport pulse duration (Δt_t) is set such that for all beam path parameter values (X, α) in the target tolerance range (ΔX_S), the laser radiation is coupled into the hollow core (4A) while preserving the material and/or the structure (37) of the hollow-core optical fiber (1).

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