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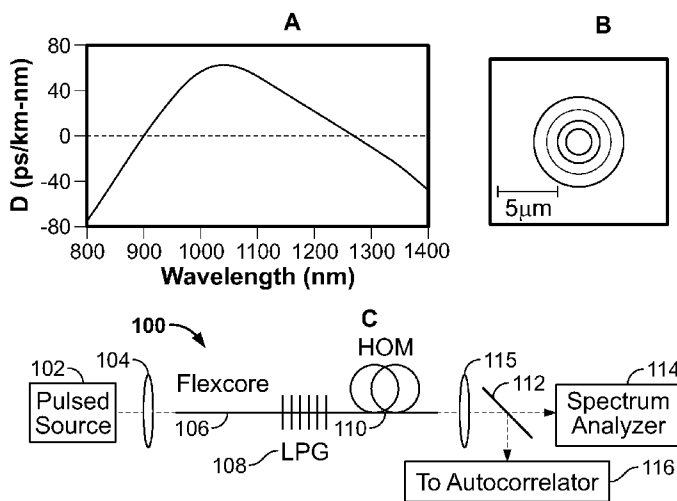
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(54) Title: PRODUCTION OF OPTICAL PULSES AT A DESIRED WAVELENGTH USING SOLITON SELF-FREQUENCY SHIFT



(57) Abstract: An apparatus for producing optical pulses of a desired wavelength includes an optical pulse source operable to generate input optical pulses at a first wavelength, and a higher order mode (HOM) fiber module operable to receive the input optical pulses at the first wavelength, and thereafter to produce output optical pulses at the desired wavelength by soliton self-frequency shift (SSFS). The present invention also relates to a method of producing optical pulses having a desired wavelength. This method includes generating input optical pulses using an optical pulse source, where the input optical pulses have a first wavelength and a first spatial mode. The input optical pulses are delivered into an HOM fiber module to alter the wavelength of the input optical pulses from the first wavelength to a desired wavelength by soliton self-frequency shift (SSFS) within the HOM fiber module, thereby producing output optical pulses having the desired wavelength.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/82623

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - H01S 3/30 (2008.01)

USPC - 372/6

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

USPC: 372/6

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC: 372/6

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

USPTO WEST (PGPB, USPT, EPAB, JPAB); Google Scholar

Search terms: laser or CPA or chirped pulse amplification, optical pulse, tunable or tuning or alter or adjust or desired wavelength, fiber module or source or hom or higher order mode, ssfs or soliton self frequency shift, mode converter, pulse energy, lithium niobate

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2002/0168161 A1 (PRICE et al.) 14 November 2002 (14.11.2002), abstract, Fig. 1, para [0009]-[0012], [0019], [0059]-[0072], [0076], [0086]-[0098]	1-57
Y	US 2005/0163426 A1 (FERMANN et al.) 28 July 2005 (28.07.2005), Fig. 7, claim 14, para [0006]-[0008], [0023], [0050]-[0053], [0060]-[0064], [0068], [0095]	1-57
Y	US 6,445,939 B1 (SWANSON et al.) 03 September 2002 (03.09.2002), col 3, ln 55 to col 4, ln 29, col 13, ln 17-30, col 19, ln 38-43	27-29

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

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