# (12) 按照专利合作条约所公布的国际申请

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(81) 指定国 (除另有指明，要求每一种可提供的国家保护): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW。

(84) 指定国 (除另有指明，要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA,


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(54) **Title**: DATA PROCESSING METHOD, OPTICAL RECEIVER, AND OPTICAL NETWORK SYSTEM

(54) **发明名称** : 一种数据处理方法、光接收机及光网络系统

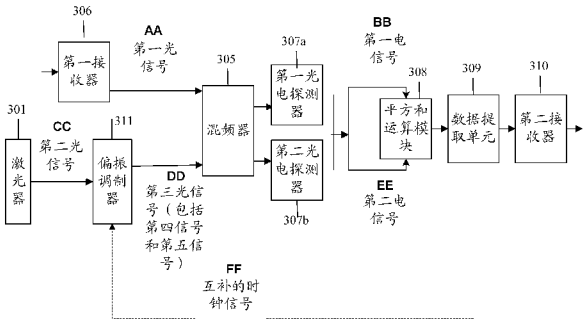


图 4 / **Fig.** 4

301 LASER
305 MIXER
306 FIRST RECEIVER
307A FIRST PHOTOELECTRIC DETECTOR
307B SECOND PHOTOELECTRIC DETECTOR
308 QUADRATIC SUM OPERATION MODULE
309 DATA EXTRACTION UNIT
310 SECOND RECEIVER
311 POLARIZATION MODULATOR
AA FIRST OPTICAL SIGNAL
BB FIRST ELECTRICAL SIGNAL
CC SECOND OPTICAL SIGNAL
DD THIRD OPTICAL SIGNAL (COMPRISING A FOURTH SIGNAL AND A FIFTH SIGNAL)
EE SECOND ELECTRICAL SIGNAL
FF COMPLEMENTARY CLOCK SIGNAL


(57) **Abstract**: Disclosed are a data processing method, an optical receiver, and an optical network system, which relate to the technical field of communication networks, can reduce the system complexity and upgrade costs. In the present invention, a first optical signal sent by an optical network unit is received; at least one second optical signal is generated, polarization state adjustment and control are performed on the at least one second optical signal, and a third optical signal is output, so that polarization states of the third optical signal at a first half period and a second half period are perpendicular to each other, one period being a time required to transmit any bit of the first optical signal; mixing and photoelectric conversion are performed on the first optical signal and the third optical signal to output at least one electrical signal; operation processing is performed on the at least one electrical signal to output a third electrical signal; and a data signal is restored according to the third electrical signal, and is sent. The solution provided by embodiments of the present invention is applicable during coherent PON receiving independent of polarization.

(57) **摘要**:


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RW, SD, SL, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), 欧洲 (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)。

**本国际公布**:

— 包括国际检索报告(条约第 21 条(3))。

— 在修改权利要求的期限届满之前进行，在收到该修改后将重新公布(细则 48.2(h))。

— 根据申请人的请求，在条约第 21 条(2)(a)所规定的期限届满之前进行。

**(88) 国际检索报告公布日期**: 2013 年 2 月 21 日

本发明公开一种数据处理方法、光接收机及光网络系统，涉及通信网络技术领域，可以降低系统复杂度，降低升级成本。本发明通过接收光网络单元发送的第一光信号；产生至少一束第二光信号，对所述至少一束第二光信号进行偏振态调整以及控制，输出第三光信号，使得所述第三光信号在前半个周期与后半个周期的偏振态互相垂直，其中所述 1 个周期为传输所述第一光信号中的任意 1 个比特所需的时间；将所述第一光信号与所述第三光信号进行混频、光电转换后，输出至少一路电信号；将所述至少一路电信号经过运算处理，输出第三电信号；根据所述第三电信号，恢复出数据信号并进行发送。本发明实施例提供的方案适合在偏振无关的相干 PON 接收时采用。

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2012/073240

**A. CLASSIFICATION OF SUBJECT MATTER**

H04B10/148 (2006.01)i

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)

IPC: H04B,H04Q,H04W

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

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

CNPAT,CNKI,WPI,EPODOC: light, polariz+, ONU, ONT, optical, vertical, orthogonal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim |
|---|---|---|
| X | CN102142901A<br>(WUHAN RESEARCH INSTITUTE OF POSTS AND TELECOMMUNICATIONS)<br>03 Aug.2011(03.08.2011) description, pages 1-2 | 1-14 |
| A | US2010/0322624A1 (NATIONAL TAIWAN UNIVERSITY OF SCIENCE AND TECHNOLOGY)<br>23 Dec.2010(23.12.2010) the whole document | 1-14 |

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"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)

"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

"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

"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

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 10 Sept.2012 (10.09.2012) | 20 Dec. 2012 (20.12.2012) |
| Name and mailing address of the ISA<br>State Intellectual Property Office of the P. R. China<br>No. 6, Xitucheng Road, Jimenqiao<br>Haidian District, Beijing 100088, China<br>Facsimile No. (86-10)62019451 | Authorized officer<br>WANG, Yixuan<br>Telephone No. (86-10)62413504 |

Form PCT/ISA /210 (second sheet) (July 2009)

# INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2012/073240

| Patent Documents referred in the Report | Publication Date | Patent Family | Publication Date |
|---|---|---|---|
| CN102142901A | 03.08.2011 | NONE | |
| US2010/0322624A1 | 23.12.2010 | NONE | |

# 国际检索报告

国际申请号
**PCT/CN2012/073240**

**A. 主题的分类**

H04B10/148 (2006.01)i

按照国际专利分类(IPC)或者同时按照国家分类和 IPC 两种分类

**B. 检索领域**

检索的最低限度文献(标明分类系统和分类号)

IPC: H04B,H04Q,H04W

包含在检索领域中的除最低限度文献以外的检索文献

在国际检索时查阅的电子数据库(数据库的名称，和使用的检索词（如使用）)

CNPAT,CNKI,WPI,EPODOC: 光、偏振、光网络单元、垂直、正交、polariz+、ONU、ONT、optical、light

**C. 相关文件**

| 类　型* | 引用文件，必要时，指明相关段落 | 相关的权利要求 |
|---|---|---|
| X | CN102142901A (武汉邮电科学研究院) 03.8 月 2011 (03.08.2011)<br>说明书第 1-2 页 | 1-14 |
| A | US2010/0322624A1 (NATIONAL TAIWAN UNIVERSITY OF SCIENCE AND TECHNOLOGY) 23.12 月 2010 (23.12.2010) 全文 | 1-14 |

☐ 其余文件在 C 栏的续页中列出。　　☒ 见同族专利附件。

* 引用文件的具体类型：

"A" 认为不特别相关的表示了现有技术一般状态的文件

"E" 在国际申请日的当天或之后公布的在先申请或专利

"L" 可能对优先权要求构成怀疑的文件，或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件（如具体说明的）

"O" 涉及口头公开、使用、展览或其他方式公开的文件

"P" 公布日先于国际申请日但迟于所要求的优先权日的文件

"T" 在申请日或优先权日之后公布，与申请不相抵触，但为了理解发明之理论或原理的在后文件

"X" 特别相关的文件，单独考虑该文件，认定要求保护的发明不是新颖的或不具有创造性

"Y" 特别相关的文件，当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时，要求保护的发明不具有创造性

"&" 同族专利的文件

| 国际检索实际完成的日期 | 国际检索报告邮寄日期 |
|---|---|
| 10.9 月 2012 (10.09.2012) | **20.12 月 2012 (20.12.2012)** |
| ISA/CN 的名称和邮寄地址：<br>中华人民共和国国家知识产权局<br>中国北京市海淀区蓟门桥西土城路 6 号 100088<br>传真号：　(86-10)62019451 | 受权官员<br>王怡轩<br>电话号码：(86-10) **62413504** |

# 国际检索报告

关于同族专利的信息

国际申请号
**PCT/CN2012/073240**

| 检索报告中引用的专利文件 | 公布日期 | 同族专利 | 公布日期 |
|---|---|---|---|
| CN102142901A | 03.08.2011 | 无 | |
| US2010/0322624A1 | 23.12.2010 | 无 | |