RECORDATION FORM COVER SHEET

PATENTS ONLY

To the Assistant Commissioner for Patents: Please record the attached original documents or copy thereof. 2. Name and address of receiving 1. Name of conveying party(ies):

Toshiaki Koike-Akino; Philip V. Orlik Kieran Parsons

Additional name(s) of conveying party(ies) attached? []Yes [X]No

3. Nature of Conveyance:

[X] Assignment

[]Merger

[]Security Agreement []Change of Name

Execution Dates: February 4, 2012; March 5,

2012; and March 12, 2012

party(ies):

Name: Mitsubishi Electric Research Laboratories, Inc.

Street Address: 201 Broadway

City: Cambridge State: MA Zip: 02139

Additional name(s) and address(es) attached? []Yes [X]No

- 4. Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application is:
 - A. Patent Application No.(s)

B. Patent No.(s)

13/086,020

Additional numbers attached? []Yes [X]No

5. Name and address of party to whom correspondence concerning document should be mailed:

Name: Mitsubishi Electric Research

Laboratories, Inc.

Street Address: 201 Broadway

City: Cambridge State: MA Zip: 02139

- 6. Total number of applications and patents involved: [1]
 - 7. Total fee (37CFR 3.41): \$40.00
- [] Enclosed
- [X] Authorized to be charged to deposit account

8. Deposit account number: 50-0749

DO NOT USE THIS SPACE

Statement and signature.

To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.

Erika J. Cherko-Soykan Name of Person Signing

/Erika J. Cherko-Soykan/

Mar. 12, 2012

Signature Total number of pages comprising cover sheet: [1]

ASCVRLTR . FRM

PATENT REEL: 027856 FRAME: 0290

700481898

ASSIGNMENT

WHEREAS, We, <u>LISTED INVENTORS</u>, have made certain inventions or discoveries (or both) set forth in an Application for Utility Patent of the United States of America entitled "Cross-Free High Dimensional Constellations for Dual-Polarized Non-Linear Fiber-Optic Communications," the specification of which:

- was executed by us on the date indicated below;
- x was filed on April 13, 2011 as Application Serial No. 13/086,020
- was patented under U.S. Patent No. __ on __;

WHEREAS, Mitsubishi Electric Research Laboratories, Inc., a corporation of the State of Delaware, whose address is 201 Broadway, Cambridge, Massachusetts 02139, and who, together with its successors and assigns is hereinafter called "Assignee", is desirous of acquiring the entire right, title, and interest together with the benefits and privileges hereinafter recited;

NOW, THEREFORE, for valuable consideration furnished by Assignee to us, receipt and sufficiency of which we hereby acknowledge, we hereby, without reservation;

- 1. Assign, transfer and convey to Assignee the entire right, title and interest together with the benefits and privileges in and to said inventions and discoveries, said Application for Letters Patent or similar forms of protection of the United States of America, and all other applications for Letters Patent on said inventions and discoveries in whatsoever countries, including all divisional, renewal, substitute, continuation and convention applications based in whole or in part upon said inventions or discoveries, or upon said application, and any and all Letters Patent, reissues and extensions of Letters Patent or similar forms of protection granted for said inventions and discoveries or upon said applications, and every priority right that is or may be predicated upon or arise from said inventions, said discoveries, said applications and said Letters Patent;
 - 2. Authorize Assignee to file patent applications in

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any or all countries or groups of countries on any or all of said inventions and discoveries in our name or in the name of Assignee or otherwise as Assignee may deem advisable, under the International Convention or any other relevant convention or treaty or otherwise;

- 3. Authorize and request the Assistant Commissioner for Patents of the United States of America and the empowered officials of all other governments to issue or transfer all said Letters Patent to Assignee, as Assignee of the entire right, title and interest therein or otherwise as Assignee may direct;
- 4. Warrant that we have not knowingly conveyed to others any rights in said inventions, discoveries, applications or patents or any license to use the same or to make, use or sell anything embodying or utilizing any of said inventions or discoveries; and that we have good right to assign the same to Assignee without encumbrance;
- 5. Bind our heirs, legal representatives and assigns, as well as ourselves, to do, upon Assignee's request and at Assignee's expense, but without additional consideration to us or them, all acts reasonable serving to assure that said inventions and discoveries, said patent applications and said Letters Patent shall be held and enjoyed by Assignee as fully and entirely as the same could have been held and enjoyed by us, our heirs, legal representatives and assigns if this assignment had not been made; and particularly to execute and deliver to Assignee all lawful application documents including petitions, specifications, and oaths, and all assignments, disclaimers, and lawful affidavits in form and substance as may be requested by Assignee; to communicate to Assignee all facts known to us relating to said inventions and discoveries or the history thereof; and to furnish Assignee with any and all documents, photographs, models, samples and other physical exhibits in our control or in the control of our heirs, legal representatives or assigns which may be useful for establishing any facts of our conceptions, disclosures, and reduction to practice of said inventions or discoveries.

IN WITNESS WHEREOF:

DATE I SIGNED INVENTOR'S DECLARATION: April 11, 2011

Marke Date: Feb. 24, 2012

County of Middlesex

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Subscribed and sworn to before me by the above-named Toshiaki Koike-Akino this 24th Day of Fromany

Suha Chello-Suglan Notary Public

My Commission Expires:

September 22, 2017

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IN WITNESS WHEREOF:

DATE I SIGNED INVENTOR'S DECLARATION: April 13, 2011

Philip V. Orlik

12/5/20/2 Date: 3/5/20/2

County of Middlesex

)ss)

Subscribed and sworn to before me by the above-named Philip V. Orlik this _54 Day of _______, 2012.

Entra Mula Sylva Notary Public

My Commission Expires:

September 22, 2017

ERIKA CHERKO-SOYKAN

NOTARY PUBLIC

COMMONWEATH OF MASSACHUSETTS

My Comm. Explires Sept. 22, 2017

IN WITNESS WHEREOF:

DATE I SIGNED INVENTOR'S DECLARATION: April 12, 2011

County of Middlesex

Subscribed and sworn to before me by the above-named Kieran Parsons this 10th Day of March 2012.

)\$S

Eula Cherho-Sylun Notary Public

My Commission Expires:

September 22, 2017

