



## METHOD AND RECIRCULATING LOOP SYSTEM FOR LONG HAUL TRANSMISSION IN OPTIC COMMUNICATION

### IITM Technology Available for Licensing

#### Problem Statement

- Generally, back-haul data transport of wireless and cloud services completely relies on **use of fiber-optic cables due to low loss property over very large bandwidths** and for distances up to several tens of thousands of kilometers.
- In order to study performance of data transmission over such large distances can be achieved by **an alternative system where output of one span of fiber is fed back to an input of the same span of fiber** and signal is allowed to circulate in the same span until a desired length of fiber transmission is achieved.
- This recirculating loop can then be used to emulate long-haul transmission in the laboratory and **simplify test-bed cost and space effectively**.
- All the demonstrations of the **recirculating loop employ two optical switches** which makes the recirculating loop consume large amount of space and also expensive.
- Further, the procedure for operating the two optical switches is a time cumbersome process. Thus, the **present invention proposes an alternative using single optical switch** to address the above shortcomings.

#### Technology Category/ Market

##### Telecommunication, Data & Optic communication

**Applications** - Optical memories, fast data buffer applications, microwave photonic filters.

**Market** - The global optical communication and networking market grew from **\$22.1 billion in 2022** to \$23.81 billion in 2023 at a CAGR of 7.7%, and is expected to grow to **\$29.51 billion in 2027 at a CAGR of 5.5%**.

#### Key Features / Value Proposition

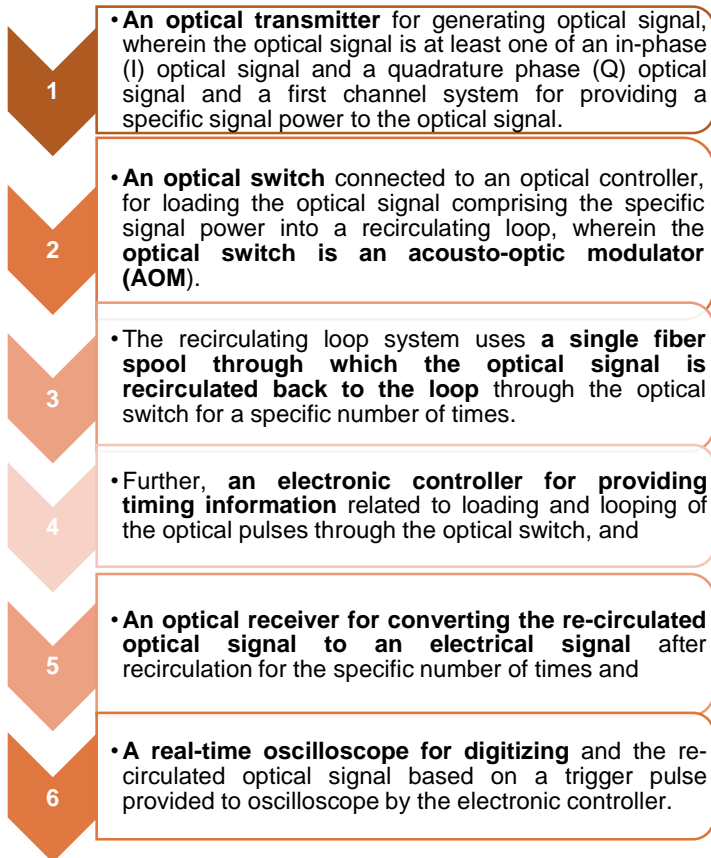
- The recirculating loop for single mode fibers **uses a single optical switch**, thus **reducing overall design cost**.
- Can support all types of modulation**
- Programmable method to **increase in number of spans**.
- The same design can also be **extended to recirculating loops of specialty fibers**.

#### Intellectual Property

- IITM IDF Ref. **2275**
- IN 428828 - Patent Granted**

#### Technology

- The principal object of the invention is to provide a **recirculating loop system for long haul transmission** in optic communication (refer Fig. 1, 2). The recirculating loop system includes:



#### TRL (Technology Readiness Level)

TRL - 3, Proof of concept stage

#### Research Lab

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Fig. 1. is a block diagram of a recirculating loop system for long haul transmission in optic communication

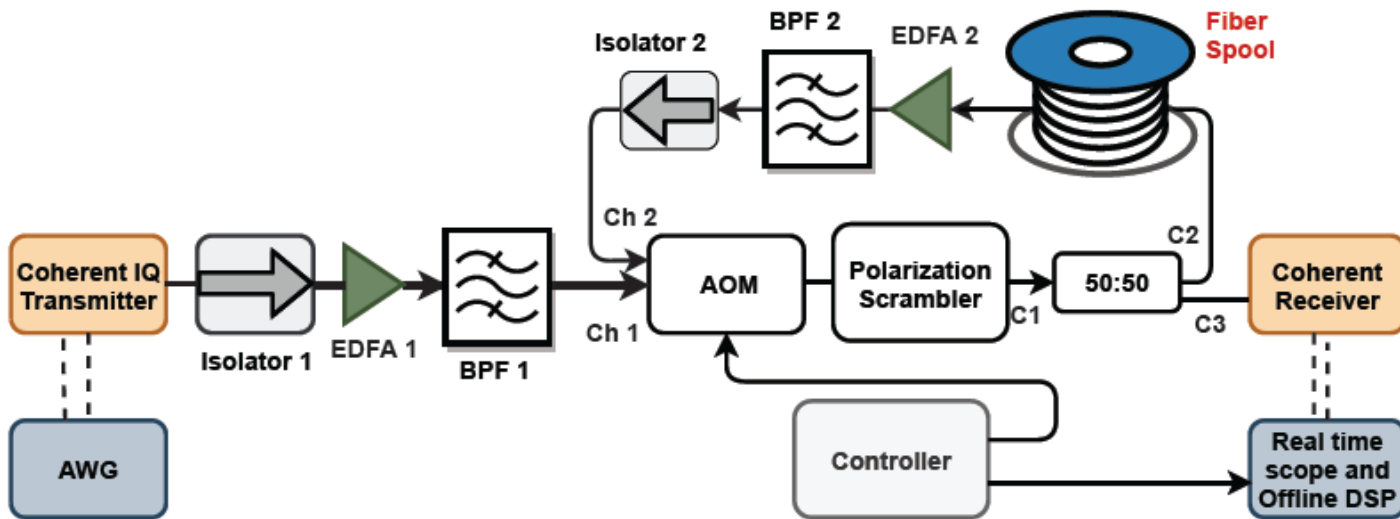
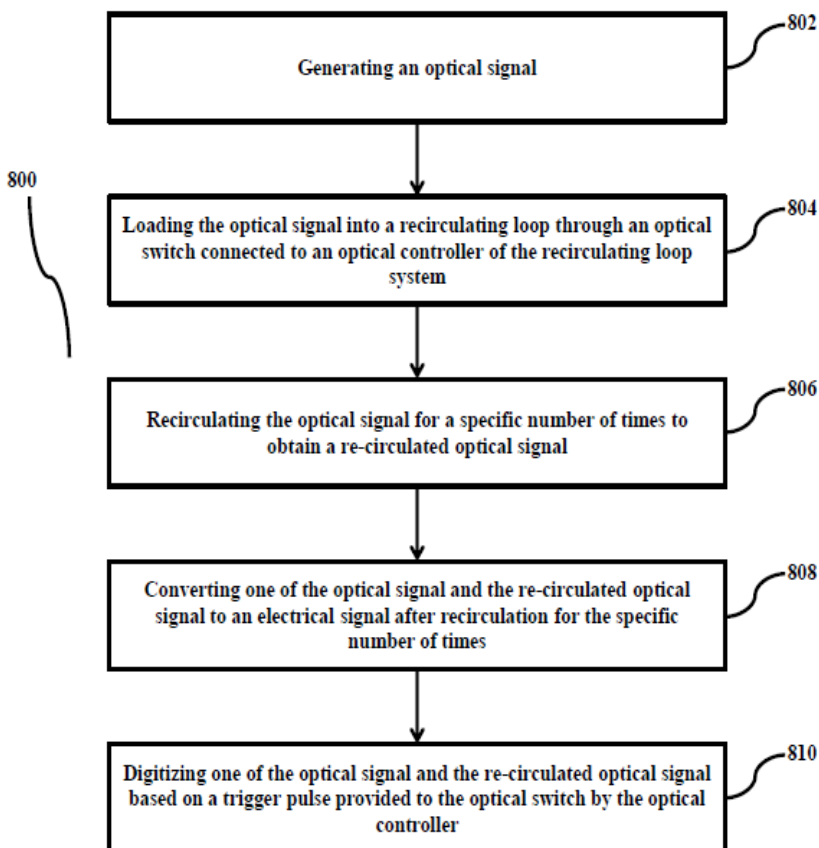


Fig. 2. is a flow chart illustrating a method for long haul transmission in the optic communication using the recirculating loop system



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