Bidirectional Self-Starting Ultrafast Fiber Laser

UA ID Technology #ua18-067

Title: Bidirectional Self-Starting Ultrafast Fiber Laser

Invention: This technology is a bidirectional, self-starting, ultrafast fiber that has a mode-locked operation that is assisted by polarization multiplexing optical fibers. It has a specialized non-reciprocal element, which assigns a polarization to a propagation direction and forces the laser to operate in two separate polarizations in at least one part of the cavity.

Background: Starting mode-locked operation in a bidirectional fiber laser requires a control system or a technician, and fiber laser systems are typically complex in design. Alignment is difficult and needs to be tweaked often. The invention presented here has solutions for both of these issues by being self-starting and utilizing components that drastically simplify the system design and alignment.

Applications:

- Material processing
- Defense
- Medical

Advantages:

- Enhances performance compared to conventional lasers
- Eliminates need for adjustments during operation
- Self-starting
- Bi-directional
- Cost-effective dual comb technology
- Does not require polarization preserving filters

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