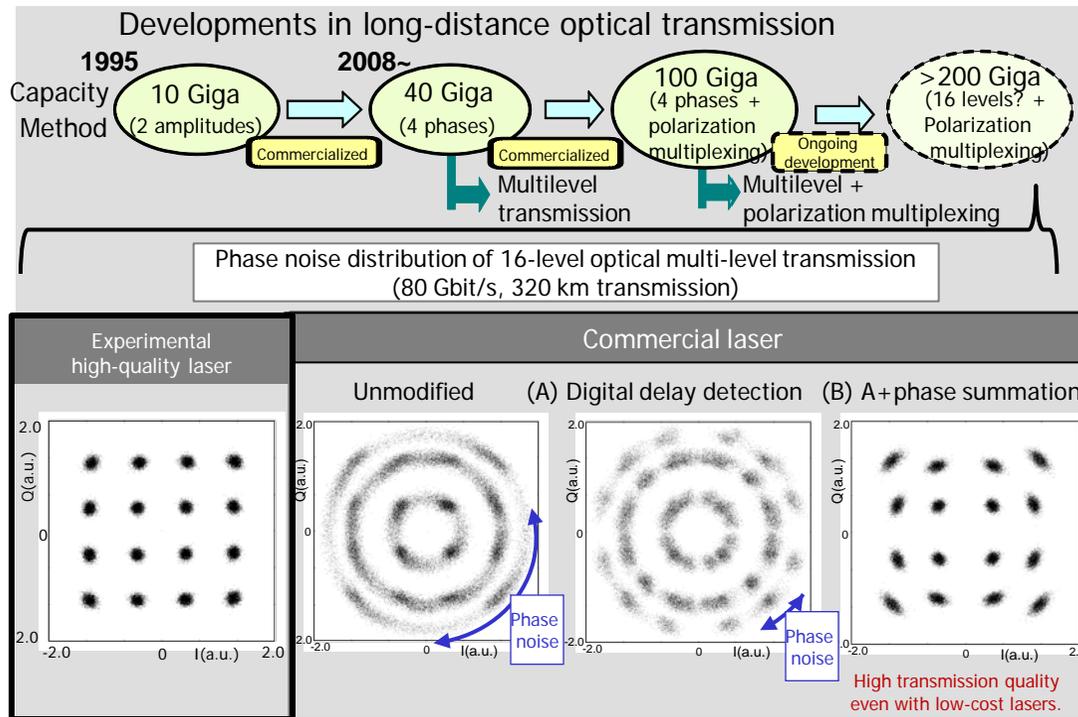


Signal processing technology for long-distance optical fiber communication with 16-level optical multi-level signal using commercial semiconductor lasers



We developed signal processing technologies for high-quality transmission with “low-cost commercial semiconductor lasers” that are essential in the commercialization of 16-level optical multilevel transmission, which has four times the capacity of conventional binary modulation. This is important in realizing future high-capacity long-distance optical fiber communication networks .

■ Features of the technology

- 1) Reduction in phase noise: “Digital delay detection technology”
We developed a “digital delay detection technology” which subtracts phase component of a previously received signal from that of the current received signal. This reduces phase noise and improves signal quality.
- 2) Modification of signal position: “Phase summation technology”
Digital delay detection technology results in disorientation of received signals. Thus, we developed a “phase summation technology” that sums the phases of subtracted signals prior to signal transmission.

■ Future plans

We are applying these technologies for the commercialization of ultra-high-speed optical fiber communication systems at 400 Gbit/s.

■ Presentation in conferences

These results have been presented in the 37th European Conference and Exhibition on Optical Communication (ECOC).

■ A word from the researchers:

To further increase transmission capacity, we will pursue research on technologies for increasing signal levels beyond 16 levels. Likewise, we will also conduct research on cost-reduction and downsizing for future commercialization.