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(57) Abstract :
The invention relates to a device for high-speed optical data transmission using multi-mode lasers (101). The device comprises a beam-shaping unit (102), adaptive modulation block (103), multi-mode fiber (104), dynamic mode control (105), error correction module (106), and output interface (107). Monitoring sensors (108) and a control processor (109) ensure adaptive optimization. The system minimizes modal dispersion, reduces latency, and enhances spectral efficiency, thereby enabling reliable, energy-efficient, and cost-effective optical communication compatible with existing multi-mode infrastructures.

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