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Free Space Data L inks for HEP Experiments

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We are developing data links in air, utilizing steering by MEMS mirrors, and an optical feedback path for the control loop. The laser, modulator, and lens systems used are described, as well as two different electronic systems for the steering feedback loop.
This system currently operates at 1 Gb/s, but could be upgraded.
This link works over distances of order meters. Other links for long distances are discussed. Such links might enable one to move communications lasers out of tracking detectors, for reasons such as reliability and power consumption. Some applications for data links in air are described, such as local triggering, data readout and trigger-clock distribution.

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