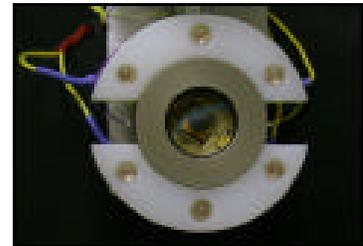
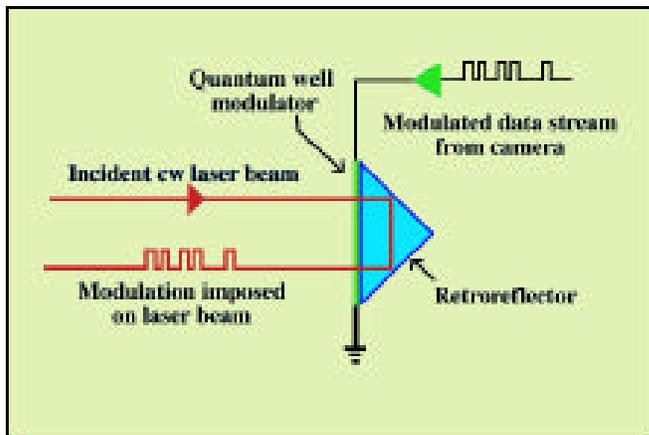


FREE SPACE OPTICAL DATA TRANSFER USING MODULATING RETRO-REFLECTORS



NRL Multiple Quantum Well Retroreflector concept is illustrated above. An incident laser beam interrogates a retroreflector which is coupled with a MQW shutter. The retroreflected beam returns modulated light which is demodulated at the transmit/receive site. The device can recover telemetry, video, and bit streams with data of specific interest at rates of 10 Mbps and higher depending on the link. A modulating retro ringed with LED's to assist in acquisition and tracking is shown in the upper right. A nine-element segmented modulator is shown in the lower right. Segmented modulators enable increased yield and faster modulation rates.

The Naval Research Laboratory has developed a system that enables compact, secure, lightweight, low power, fast, free space optical data transfer by combining optical retro-reflectors with quantum-well technology to modulate an interrogating laser beam.

Advantages and features include:

- Device is small, lightweight, and has low power requirements
- Bandwidth of 300,000 GHz
- Data rates on the order of tens of Mbps
- No pointing and tracking required when configured as an array
- Communication link is compact and secure

Applications include:

- Inter-platform communication for aircraft or spacecraft configuration management
- Air/Space-to-ground communications
- Optical interconnects for telecommunications
- Remote interrogation of strategically placed communication sensors

Licenses are available to companies with commercial interest.

Points of Contact

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