

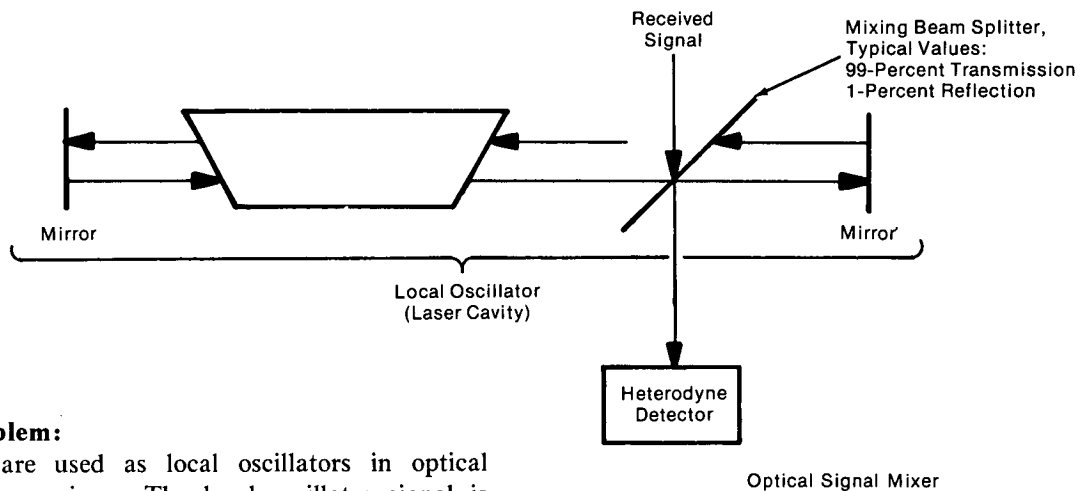
NASA TECH BRIEF

Marshall Space Flight Center



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Signal Mixer for Optical Heterodyne Receiver



The problem:

Lasers are used as local oscillators in optical heterodyne receivers. The local oscillator signal is mixed with the incoming signal by the use of a beam splitter located outside the laser cavity. This arrangement is inefficient, since power level of the laser signal outside the cavity is 50 to 100 times less than it is inside the cavity.

The solution:

Laser power can be reduced by 50 to 100 times when the beam splitter is inside the cavity.

How it's done:

In the new arrangement, as shown in the illustration, the incoming signal is mixed with the local oscillator signal by a beam splitter inside the cavity. The beam splitter is oriented at 45° to both the laser and the incoming signal. The beam splitter draws local oscillator power from the standing wave within the cavity. The signal is transmitted through the beam splitter with a low loss (approximately 1 percent) and is mixed with 1 percent of the local oscillator flux. This combination then goes to a heterodyne detector as shown.

Note:

Requests for further information may be made in writing to:

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Reference: B75-10307

Patent status:

Inquiries concerning rights for the commercial use of this invention should be addressed to:

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Categories: 03 (Physical Sciences)
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