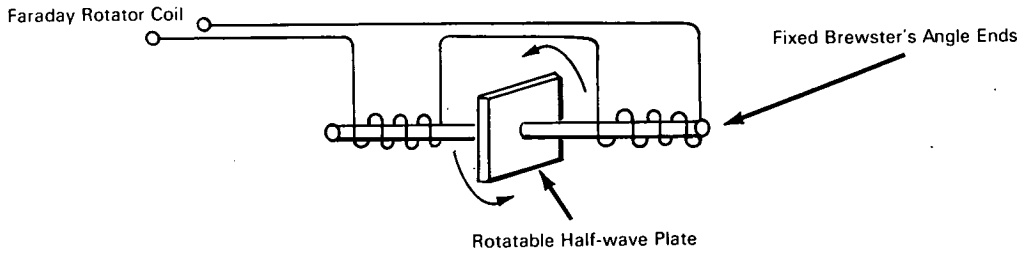
NASA TECH BRIEF

Nonreciprocal Gain Control for Ring Laser



In a ring laser, the two contracirculating beams may have differing intensities because of the residual Faraday rotation and other secondary nonreciprocal effects. To correct such effects, or to deliberately emphasize them, a nonreciprocal gain control was designed as shown.

A crystal quartz half-wave retardation plate is contained in a rotatable mount. On either side of the half-wave plate are fused silica rods with Brewster's angle ends, and on them is wound a solenoid for producing nonreciprocal Faraday rotation.

In operation, a reciprocal loss is introduced into both beams by rotating the half-wave plate, which rotates the plane of polarization away from that established by the Brewster's angle surfaces elsewhere in the ring. By passing current through the coil, one beam is then rotated in the direction of better alignment to the Brewster surfaces, while the contracirculating beam is further misaligned.

Note:

Inquiries concerning this development may be made to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B67-10653

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: Paul Lee and Gordon Dueker
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