

(GMR) $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ and in the detailed linear and non-linear susceptibility study in a series of CeFe_2 based samples showing double magnetic transition.

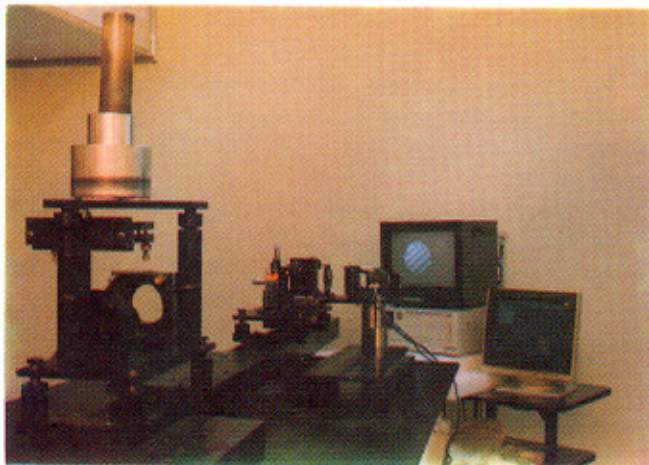
Fizeau Interferometer

A Fizeau interferometer has been developed for non contact testing of surface figure, parallelism etc of optical components. Light from a 2.0 mw He-Ne laser (6328 Å) is first spatially filtered by microscope objective pin hole combination and then made parallel by a corrected telescope objective. A reference plate, mounted on a precision tilt-able mount, is placed in front of the objective and the optical component (also mounted on a tilt-able mount) which is to be tested is placed after the reference plate. Interference occurs between light reflected from the front surface of the reference and from the job surface. A semi-aluminized beam splitter (B.S) is used to reflect the beams coming from reference and object surfaces through the opening of an iris diaphragm used for blocking unwanted reflection. Fringes are captured by means of a CCD Camera frame grabber connected to PC. The interferometer is placed on a home made vibration isolation table.

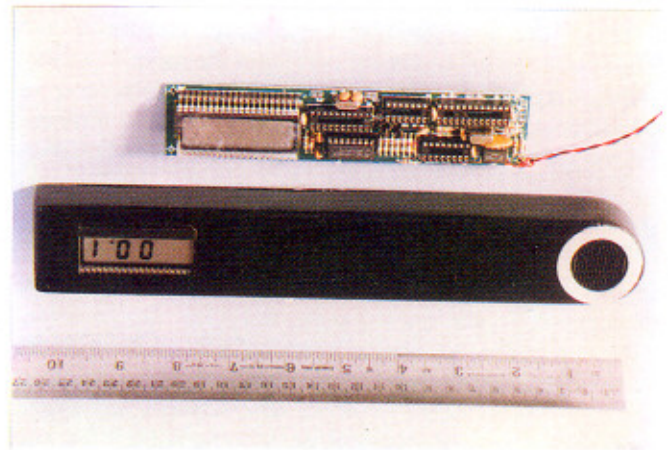
A vertical testing set up has been developed for using with this interferometer. In this set up a high surface quality mirror is used at 45° for turning the horizontal beam in vertical direction. This attachment is very useful for non contact surface testing of laser rods, block etc. Job is placed on a table with a central hole, for passing the laser beam, and three tilting screws for adjustments of its orientation.

Reference plate is mounted on a separate mirror mount below this job table. The job table needs to be aligned once with respect to the reference surface and does not require frequent alignment for different jobs. So it is very useful for testing jobs in production environment.

Liquid reference testing has been carried out using this set up by replacing the reference plate with a disk shaped liquid container with a central window for passing the laser beam. The experiment being extremely sensitive to vibration, air flow etc, controlled condition are required for obtaining stable interference fringe pattern.



Fizeau Interferometer developed at CAT



Hand held laser power meter developed at CAT

Development of hand held laser power meter

A hand held laser power meter for measurement of laser power from 1 watt to 100 watts has been developed at CAT. Compared to conventional laser power meters this instrument is light weight and compact. The unit runs on a 9V cell and consists of a sensor substrate having an active area diameter ~22 mm on which a temperature sensor is mounted. The sensor is designed in such a way that the rate of rise in temperature is linked to actual power. The electronics of the unit is divided into three parts namely - power management system, computation unit and analog to digital conversion unit. The processor takes care of various corrections such as sensor heating due to previous measurements, time of placement error etc. The unit has dimensions as 27cm x 4cm x 2.5cm and weighs about 400 gm.

Unstable super gaussian ND:YAG laser

An unstable Q-switched Nd:YAG laser using variable reflectivity mirror (VRM) has been developed. The system consists of high reflectivity concave rear mirror of 5 meter curvature and a convex variable reflecting mirror (Super

Salient Features of Hand Held Laser Power Meter

Power range	1 - 100 Watt
Active area diameter	22 mm
Resolution	0.1 Watt
Spectral range	0.3 - 11µm
Accuracy	±5%
Measurement time	6 seconds
Auto shut off time	15 seconds
Max. Average power density	200W/cm ²
Max. Target temp	110°C
Typical temperature rise per reading	0.5°C/W
Battery	9V, Square type
Size	27 cm x 4 cm x 2.5 cm
Weight	400 gm