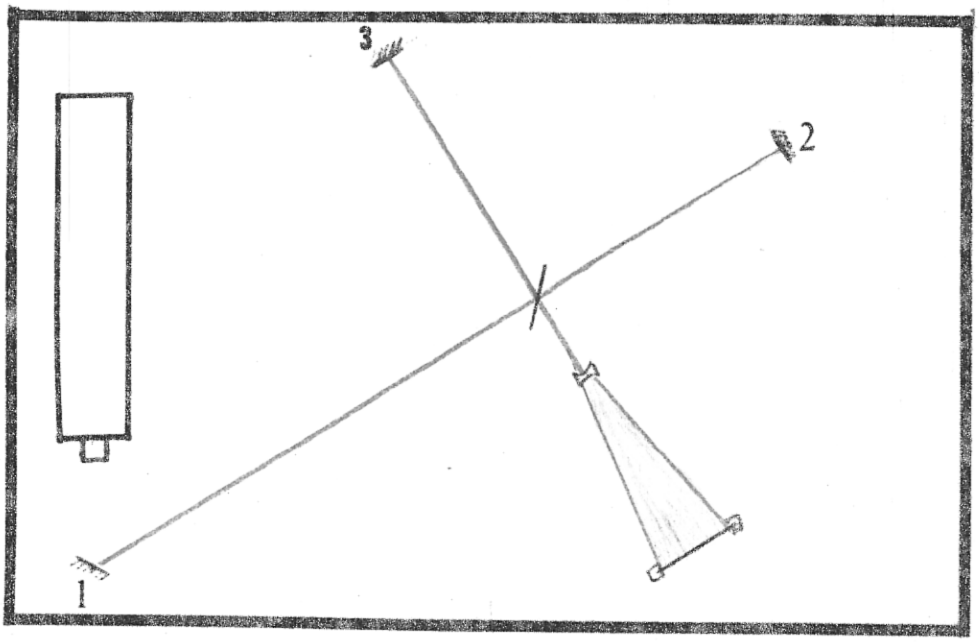
MICHELSON'S INTERFEROMETER



NOTES

This set up is used to measure the relaxation time of the isolation table in its environment. It can be used also to measure the coherence length of a laser.

Interference fringes of low spatial frequency are formed and viewed on a white card. When the table is totally stabilized, the fringes will remain in place. If there is any motion introduced into the system, such as vibration coming from the floor or component drift, the fringes will jiggle around.

SET UP STEPS

I. Direct beam diagonally down the table with the first mirror in the corner by the laser.

II. Position a second mirror kitty-corner down the table and direct the beam back onto itself.

III. Place a beamsplitter in the beam about halfway down the table, so that the two reflections are perpendicular to the first beam's path.

IV. A third mirror sends one of the beamsplitter's reflections back onto itself and onto the reflection from the opposite side of the beamsplitter. The distance from the beamsplitter to the second mirror must equal the distance from the beamsplitter to the third mirror.

V. Block out extraneous beams.

VI. Spread out the two overlapping beams with a lens onto the white card in the film holder.

VII. Observe the fringes. Tap the table and time how long it takes them to come to rest. This is the table relaxation time.

VIII. TO MEASURE COHERENCE LENGTH: Move the third mirror in closer to to the beamsplitter about an inch at a time, observing the fringes. When the end of the coherence length is reached, the fringes will grow dim and lose contrast. The coherence length then is the difference in the beam path lengths from the beamsplitter to the second mirror minus the distance from the beamsplitter to the third mirror.

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EW