

INTERFEROMETER

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**PENGUKURAN MEDAN TERMAL DENGAN
METODE INTERFEROMETER MACH-ZEHNDER**

SKRIPSI



**MILIK
PERPUSTAKAAN
UNIVERSITAS AIRLANGGA
SURABAYA**

WAHYU SETYORINI

**JURUSAN FISIKA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS AIRLANGGA
SURABAYA
2002**

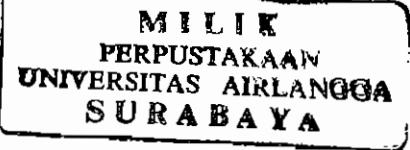
**PENGUKURAN MEDAN TERMAL DENGAN
METODE INTERFEROMETER MACH-ZEHNDER**

SKRIPSI

**Sebagai Salah Satu Syarat Untuk Memperoleh
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Pembimbing I

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Pembimbing II

A handwritten signature in black ink, appearing to be 'Retna Apsari'.

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LEMBAR PENGESAHAN SKRIPSI

Judul : **PENGUKURAN MEDAN TERMAL DENGAN METODE
INTERFEROMETER MACH-ZEHNDER**

Penyusun : **WAHYU SETYORINI**

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Pembimbing II : **Dra. Retna Apsari, M.Si**

Disetujui Oleh :

Pembimbing I



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Pembimbing II



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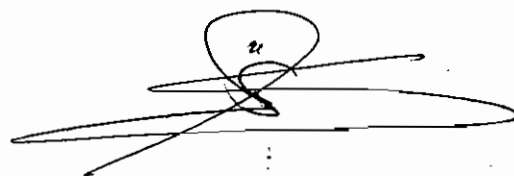
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Wahyu Setyorini, 2002. Measurement of Thermal Field by Interferometer Mach-Zehnder Method. This last task project under guidance Drs. Moh. Yasin, M.Si. and Dra. Retna Apsari, M.Si. Physics Department of Mathematics and Natural Sciences Faculty, Airlangga University.

ABSTRACT

The aim of this research is to measure thermal field of fire flame, by putting the sample in the form of flame of candle and flame of matches at one of Mach-Zehnder Interferometer arm. This research based on interference symptom of two monochromatic lights. The pattern of interference was a horizontal fringe, which got displacement due to refractive index change was caused by fire flame. The measurement of thermal field of fire flame was conducted by calculating the temperature of some points at vertical and horizontal of the top of wick. The temperature of fire could be known by investigating fire interferogram before and after presenting the fire interference. From this interferogram could be measured the score of fringe displacement (w), fringe spacing before disturbance (d). A wide of fire flame was passed by laser beam (l) could be known by measuring the fire flame directly.

The result of experiment shows that Mach-Zehnder Interferometer could be used to determine thermal field, and it is proper to use an alternative method, except by using thermocouple because according to T-test, the result of both methods have no significant difference with trust range of 95%. Mach-Zehnder Interferometer can be used to measure thermal field, because there is linearity between temperature resulted in the form of tuft with equation $T \text{ line} = -2325 w/dl + 1321,6$ with $R = -0,984$ and $T = -2334,2 w/dl + 1320,84$ with $R = -0,979$. Mach-Zehnder Interferometer can measure thermal field from temperature of 100°C to 300°C . To be expected for the study moreover can be used a computer programmed so easy to calculation some variable of points at fringe of Mach-Zehnder Interferometer.

Keywords: Mach-Zehnder Interferometer, fringe, thermal field