

ABSTRAK

PENENTUAN NILAI KOEFISIEN REDAMAN PADA PENDULUM-MAGNET DAN LEMPENG TEMBAGA MENGGUNAKAN ANALISIS VIDEO DENGAN *SOFTWARE TRACKER*

Telah dilakukan penelitian untuk menentukan nilai koefisien redaman pada pendulum-magnet dan lempeng tembaga menggunakan analisis video. Hukum Lenz dan hukum Faraday tentang induksi magnetik merupakan dasar dari penelitian mengenai osilasi pendulum-magnet yang teredam. Penelitian dilakukan dengan cara merekam osilasi pendulum-magnet terhadap lempeng tembaga dengan menggunakan kamera digital. Hasil rekaman video dianalisis menggunakan *software tracker*, sehingga diperoleh grafik posisi terhadap waktu yang kemudian difit dengan persamaan $x(t) = Ae^{-\gamma t} \cos(\omega t + \theta)$ untuk mendapatkan nilai koefisien redaman. Nilai koefisien redaman dari beberapa variasi jarak sebesar 2 mm, 4 mm, 6 mm, 8 mm dan 10 mm adalah 0,044 kgm²/s; 0,025 kgm²/s; 0,017 kgm²/s; 0,014 kgm²/s; dan 0,012 kgm²/s. Terdapat hubungan berbanding terbalik antara jarak magnet dengan lempeng tembaga terhadap besarnya nilai koefisien redaman.

Kata Kunci: nilai koefisien redaman, lempeng tembaga, tracker, jarak

ABSTRACT**DETERMINATION OF DAMPING COEFFICIENT VALUE IN MAGNETIC-PENDULUM AND COPPER PLATE USING VIDEO ANALYSIS WITH SOFTWARE TRACKER**

In this undergraduate study, a research has been conducted in order to find out the damping coefficient value of magnetic-pendulum and copper plate using video analysis. Lenz's law and Faraday's law of electromagnetic induction are used as the basic theories in this damping of magnetic-pendulum oscillation research. The research was done by recording the oscillating magnet-pendulum toward the copper plate using digital camera. Then, the video recording were analyzed using software tracker, so that position-time graph can be obtained and adjusted with $x(t) = Ae^{-\gamma t} \cos(\omega t + \theta)$ equation in order to get the damping coefficient value. From some distance variations which are 2 mm, 4 mm, 6 mm, 8 mm, and 10 mm, the damping coefficient values obtained are 0,044 kgm²/s; 0,025 kgm²/s; 0,017 kgm²/s; 0,014 kgm²/s; and 0,012 kgm²/s. This research concludes that the distance of magnetic-pendulum and copper plate is inversely proportional to the damping coefficient value.

Keyword : *damping coefficient value, copper plate, tracker, distance*