

Analisis Kinematika, Dinamika, dan Energitika Gerak Harmonik Sederhana (GHS) Sistem Massa Pegas dengan Sistem Video Based Laboratory



Oleh

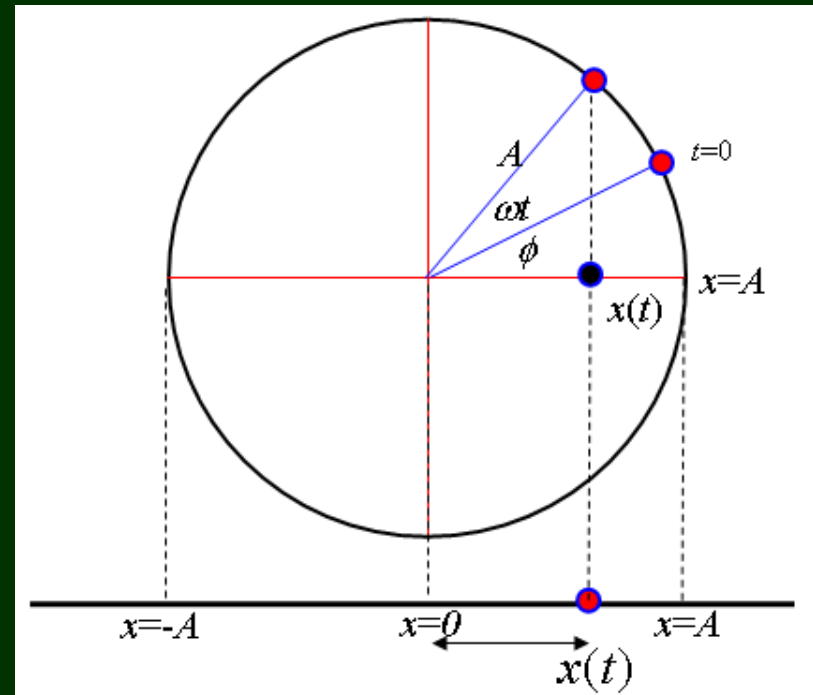
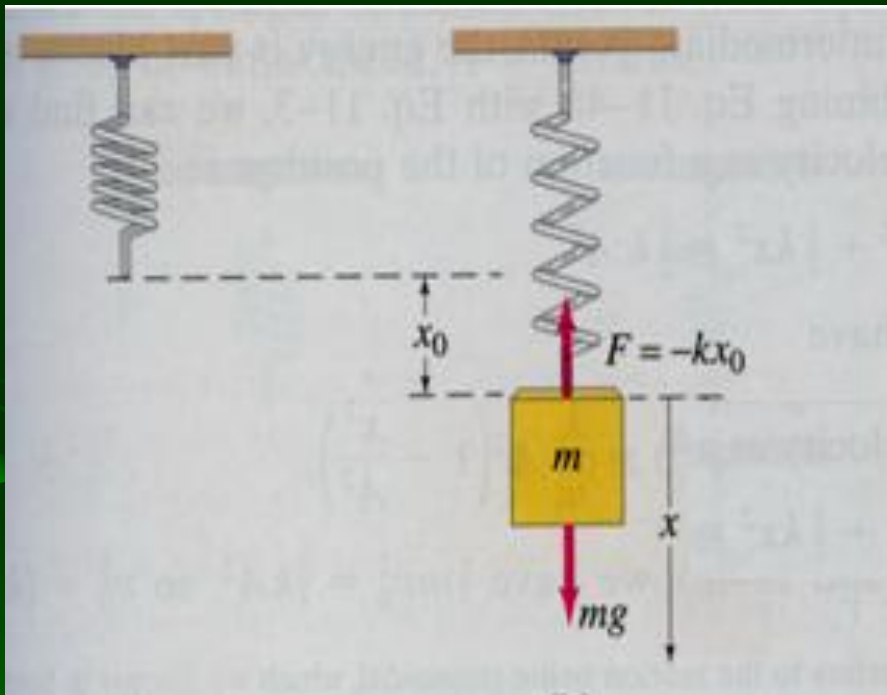
I s h a f i t

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Teori Gerak Harmonik Sederhana (GHS)

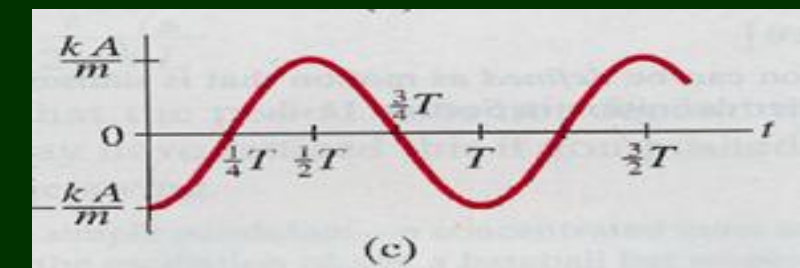
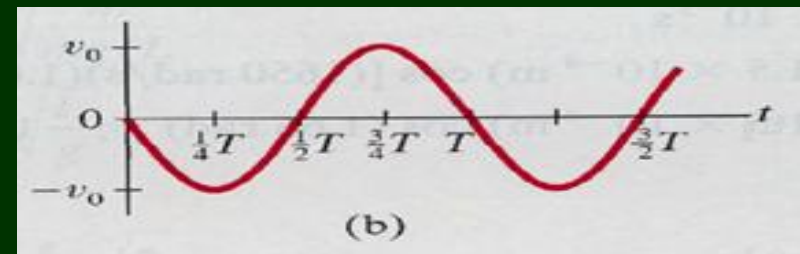
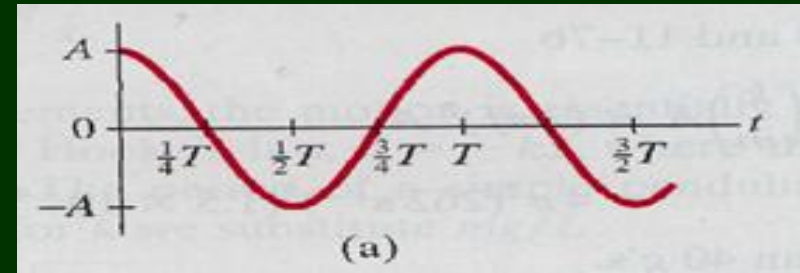


Kinematika GHS

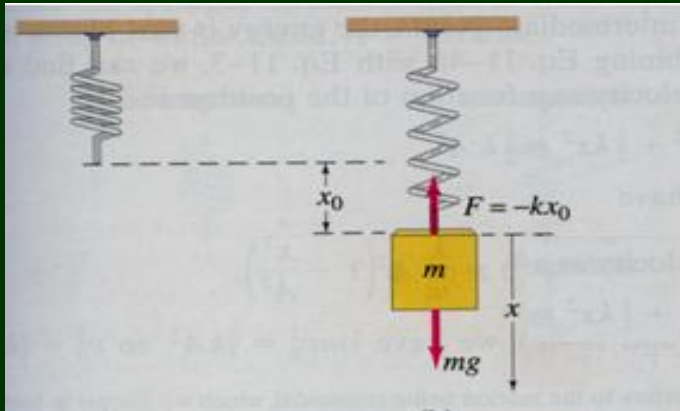
$$x(t) = A \cos(\omega t + \phi)$$

$$v_x(t) = \frac{dx}{dt} = -A\omega \sin(\omega t + \phi)$$

$$a_x(t) = \frac{dv_x}{dt} = -A\omega^2 \cos(\omega t + \phi) = -\omega^2 x$$



Dinamika GHS



$$\sum F_x = ma_x = -m\omega^2 x$$

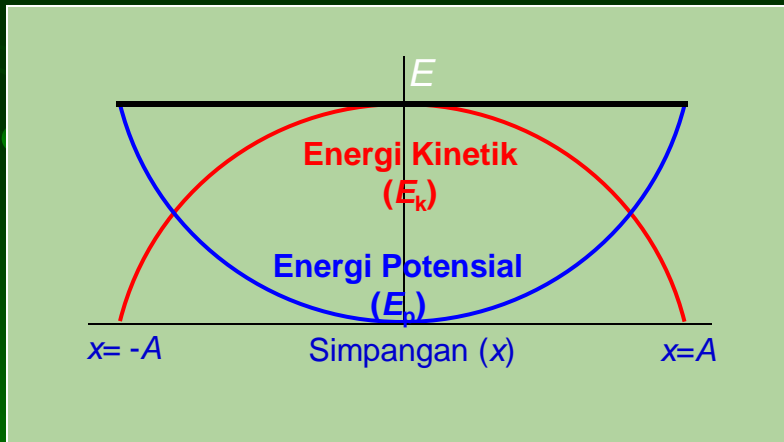
$$-kx = -m\omega^2 x$$

$$\omega = \sqrt{\frac{k}{m}}$$

$$f = \frac{1}{2\pi} \sqrt{\frac{k}{m}}$$

$$T = 2\pi \sqrt{\frac{m}{k}}$$

Energetika GHS



$$\frac{1}{2}mv_x^2 + \frac{1}{2}kx^2 = \frac{1}{2}kA^2$$

VIDEO BASED LABORATORY (VBL)



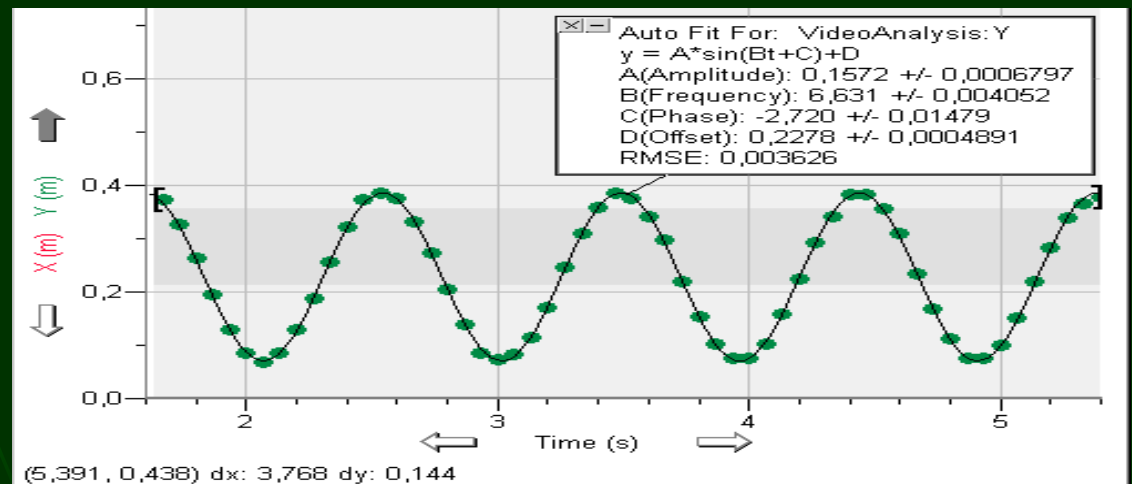
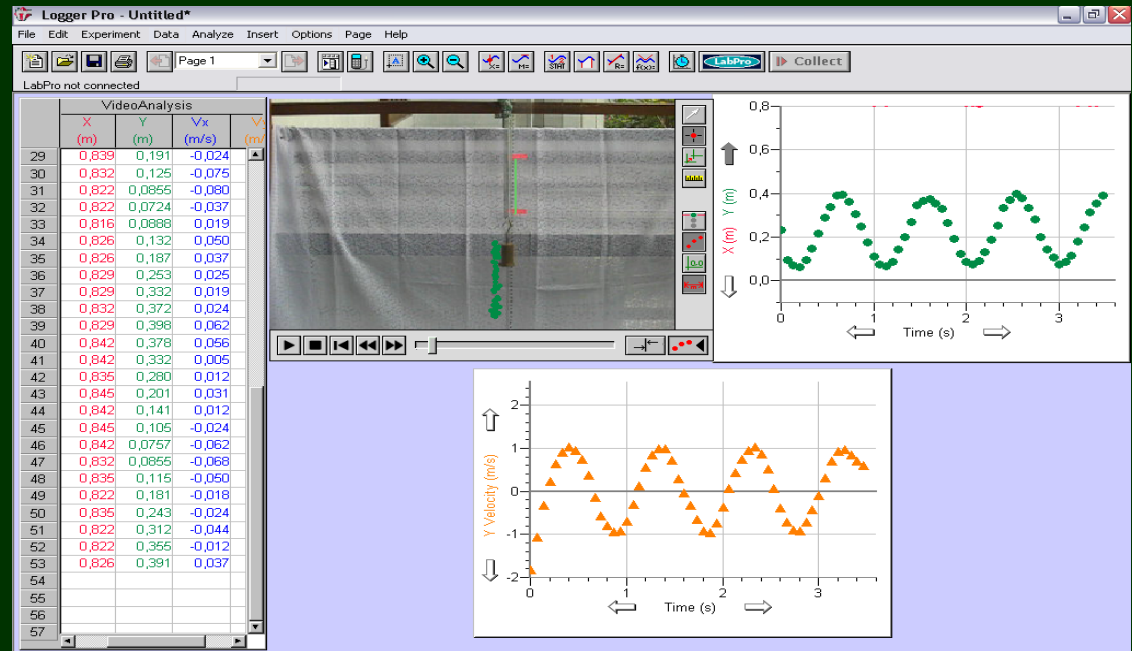
Gambar 1. Perangkat Video Based Laboratory

Proses Pembelajaran GHS

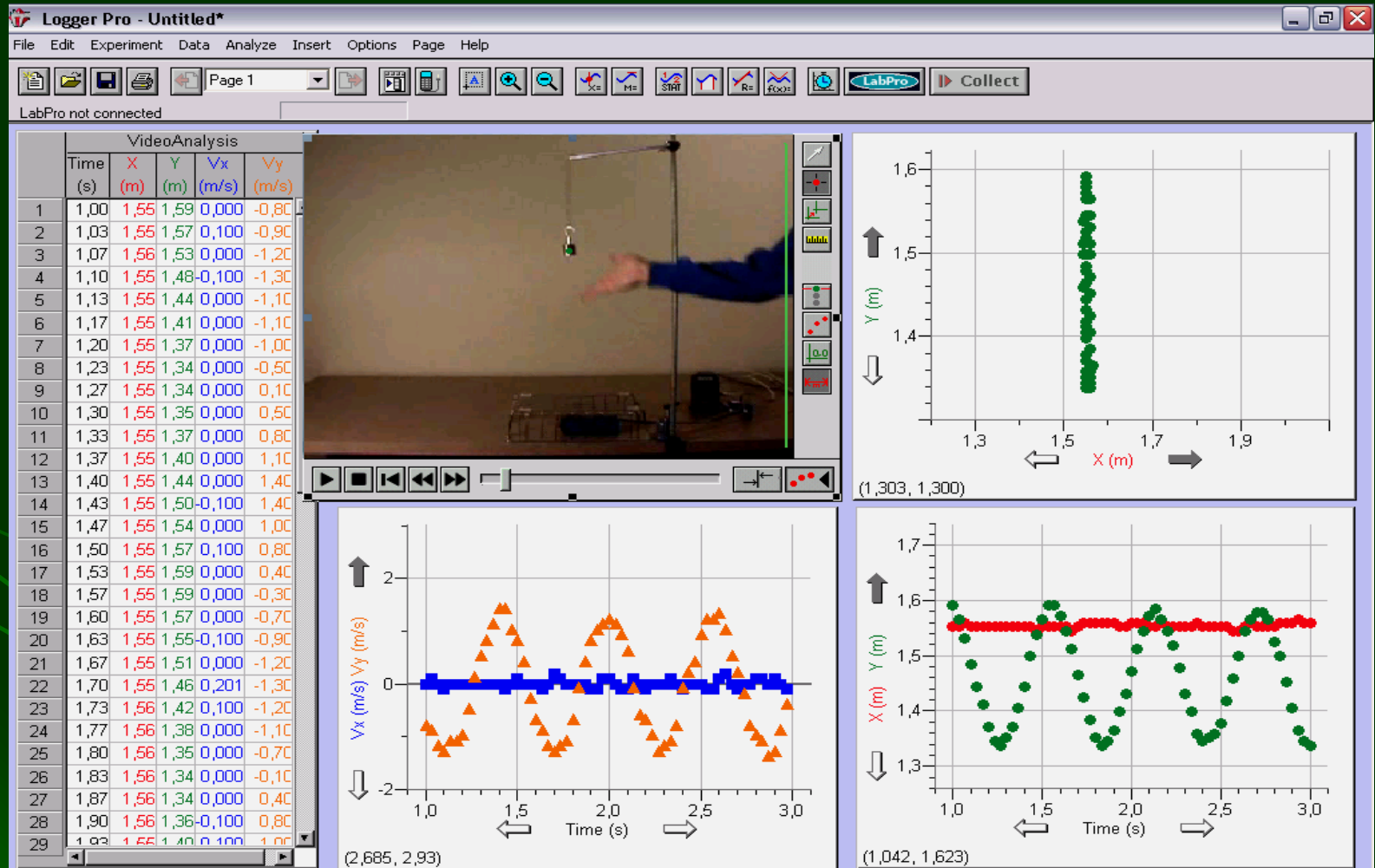
Gejala Nyata
Fisika

Representasi
Data dan Grafik

Persamaan
Empirik



Analisis GHS dengan VBL



Grafik Energi GHS

