

**Laboratory detection of gravitational waves**

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Any relative unit that changes with speed or gravity can be used to detect gravitational waves. We think that the easier one is electric voltage.

$$V = V_0 / \sqrt{1 - v^2 / c^2} \quad \Leftrightarrow$$

$$\Delta V = \frac{V_0 v}{c^2} \Delta v \quad \text{and} \quad v = \sqrt{\frac{2GM}{R}}$$

$$\Leftrightarrow \quad \Delta v = \frac{-\sqrt{2GM}}{2R^{3/2}} \Delta R$$

$$\Leftrightarrow \quad \Delta V = -\frac{V_0 GM}{c^2 R^2} \Delta R$$

Voltage variation with the distance variation of a mass.

For  $\Delta R = 1m$ ;  $V_0 = 1000V$ ;  $M = 1kg$ ;  $R = 0.001m$

$$\Delta V = 7.4 \times 10^{-19} V$$

For  $M = 2 \times 10^{30} kg$ ;  $R = 1000Ly = 9.5 \times 10^{18} m$ ;  $\Delta R = 1.5 \times 10^{11} m$

$$\Delta V = 2.5 \times 10^{-19} V$$

Why using galactic or extragalactic sources if we can reach the same accuracy in a laboratory?