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Using 3-axis accelerometer sensor to determine pendulum motion and gravitational field

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This research use 3-axis accelerometer sensor with a signal wirelessly, to study of the motion of a pendulum clock and calculated gravitational field. The 3-axis accelerometer sensor and wireless transmitter will pack into pendulum clock. In experimental using to variance length of wire of pendulum clock at 20 cm, 40 cm, 60 cm, 80 cm and 93 cm. The signal send from 3-axis accelerometer sensor pass wireless transmitter to computer by hypothermal program and analytic data by space sheet program. This experiment measure the time period from 3-axis accelerometer sensor are 0.939 s, 1.320 s, 1.580 s, 1.841 s, and 1.959s respectively. The gravitational field of the earth calculate by the time period are 8.955 m/s2, 9.063 m/s2, 9.488 m/s2, 9.318 m/s2, and 9.567 m/s2 and error are 8.624%, 7.520%, 3.179%, 4.914% and 2.378% respectively with length of wire. From the result data, the short wire the error of gravitational field is higher than long length. Because time period is short so clock frequency time to send data of wireless transmitter do not enough.

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