## Study of chaotic motion in double rod pendulum

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Chaotic system is the system that normally occurs in the nature, and it is really sensitive to initial conditions. This makes chaotic system be unpredictable after the "critical time". Most physics experiments are chaotic and, therefore, the experimental results should be collected before reaching critical time otherwise the experiment will be under chaotic condition which makes experimental results be meaningless. This research is conducted to find the factors which affect on the critical time for double pendulum. The motion of the double rod pendulum was tracked by using high speed camera and tracking program. The initial angle of the double physical pendulum to the vertical axis was varied. The critical time of each initial angle is determined by considering when the trajectories of the double physical pendulum released at the same initial angle start to diverge from each other. The results show that when the initial angle is very small, the critical time will approach infinity. On the other hand, when the initial angle is large, the critical time will reach zero. Moreover, there is some initial angles that critical time increase abruptly; meaning that the system suddenly become orderly. Furthermore, it is found that there is a good correlation between the result from the experiment and from the theory.

Authors: Mr SIRIVIBOON, Phum; Mr DENDUMRONGSUP, Wichapol; Mr SUBTHIRA, Yotawee

**Co-author:** BUAPRATHOOM, Somporn

Presenters: Mr SIRIVIBOON, Phum; Mr DENDUMRONGSUP, Wichapol; Mr SUBTHIRA, Yotawee

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