

T2: Floating table (10 pts)

A table is made by fastening a metal frame to a massive uniform plate (so they form a rigid body) and attaching it with chains to another frame that is fixed on the horizontal ground. The motion of the table is limited to the plane of the side view (right picture).

a) (4 pts) Show that in the configuration on the side view, the table is in a stable equilibrium.

b) (6 pts) Find the period T of the small oscillations.

The masses of the chains and the frame can be neglected. The chains are frictionless, inextensible, and remain tensioned in oscillations. The grid step is $a = 0.100$ m, the acceleration of gravity $g = 9.81$ m/s².

