

# The forced pendulum as a model for dynamical behavior

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## Abstract

Consider the equation of forced pendulum type:

$$u'' + V_u(t, u) = 0 \tag{*}$$

where  $' = d/dt$  and  $V$  is smooth and 1-periodic in its arguments. We will show how to use elementary minimization arguments to find a variety of solutions of (\*). We begin with periodic solutions of (\*) and then find heteroclinic solutions making one transition between a pair of periodics. Then we construct heteroclinics and homoclinics making multiple (even infinitely many) transitions between periodics. If time permits, we may also discuss the construction of related mountain pass orbits of (\*).