

Rigid Body Dynamics, SG2150

Hand in assignment 1, HT 2008

A ball rolls on a rough inclined plane surface that makes the angle β with the horizontal plane. The ball is solid and homogeneous and has radius R . The ball is started rolling with a purely horizontal center of mass velocity with speed v_0 . This means that it rolls sideways on the incline. Under the influence of gravity it starts accelerating downwards. Find the absolute value of the angular velocity, ω_1 , when the center of mass has sunk a distance h vertically. (Hint: see example 5.1 in the chapter Three dimensional motion of rigid bodies.)

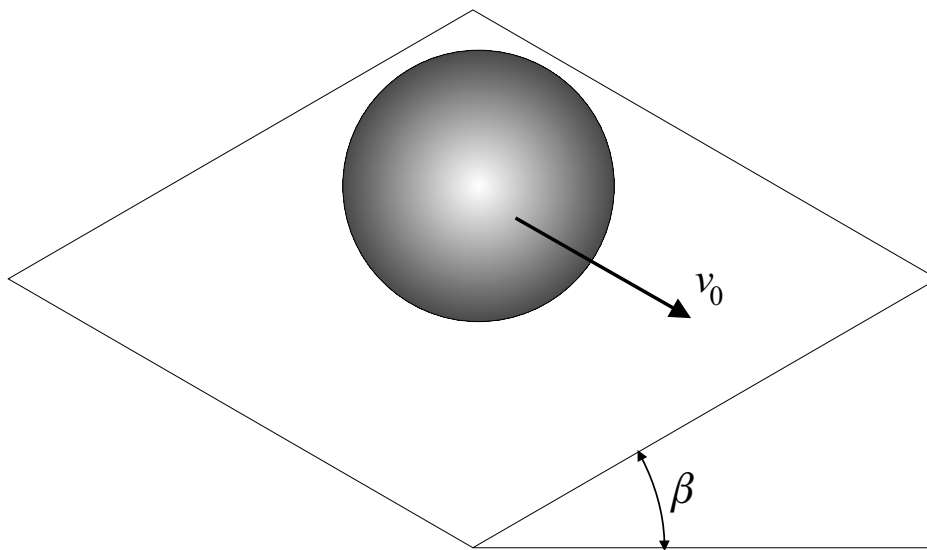


Figure 1: Figure to Hand in assignment 1