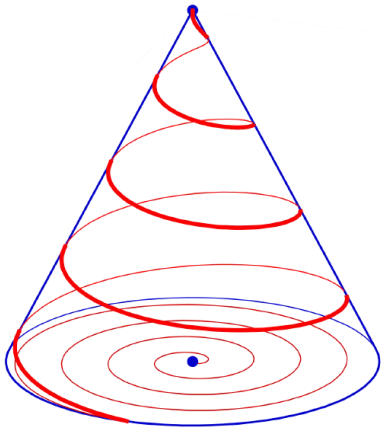
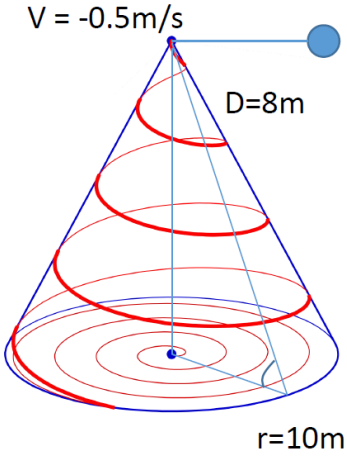
Homework

Previously, we have discussed how to design a quadratic programming based MPC to allow a single-axis triple integrator to travel from an arbitrary state to the centre of the state space, a.k.a with zero position, velocity and acceleration.

Now please design a quadratic programming based MPC to track conical spiral for a 3-axis triple integrator (basically a quadrotor model).



W = 0.08 rad /s
V = -0.5m/s



$$-6 \le v_{x,y} \le 6 \qquad -1 \le v_z \le 6$$

$$-3 \le a_{x,y} \le 3 \qquad -1 \le a_z \le 3$$

$$-3 \le j_{x,y} \le 3 \qquad -2 \le j_z \le 2$$