Problem 0.1. *The inlet of a turbofan engine is modeled as a cylinder of height H_2 and radius R_2. Inside the cylinder, there is a cone of base radius R_1 and height H_1. At the entrance of the cylinder, there is a uniform axial flow of velocity U_∞. The surface of a cone, is with a layer of ice, with the profile.*

(therefore the half-angle, denoted as

0.1   Equation of Motion of Detached ice

For the sake of simplicity, we suppose that an ice piece has the shape of a box with size $a \times b \times c$. The ice piece moves as a blunt object in the flow field, where its size is supposed to be negligible as compared to the characteristic length of the inlet. Therefore, it affects the flow field as perturbation terms and in this first insight, we neglect its effect to the flow field. Therefore, the flow field, characterized by a velocity field $\underline{u}(x, y, z)$, a pressure field $p(x, y, z)$. This field impacts the ice piece through the aerodynamics coefficient C_D, C_L and C_M.