

Initial Conditions

Environmental

Sail

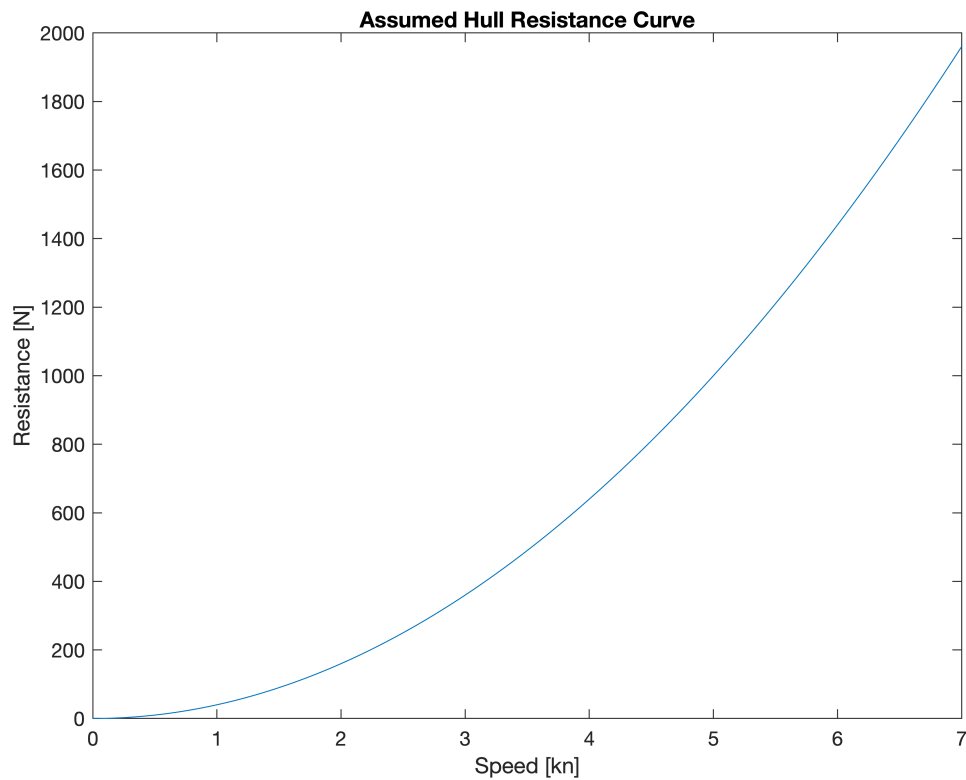
Sail area [m²] is 5.25

Sail angle of attack [deg] is 9

Sail mass [kg] is 10

Hull

Assumed resistance curve:



Keel

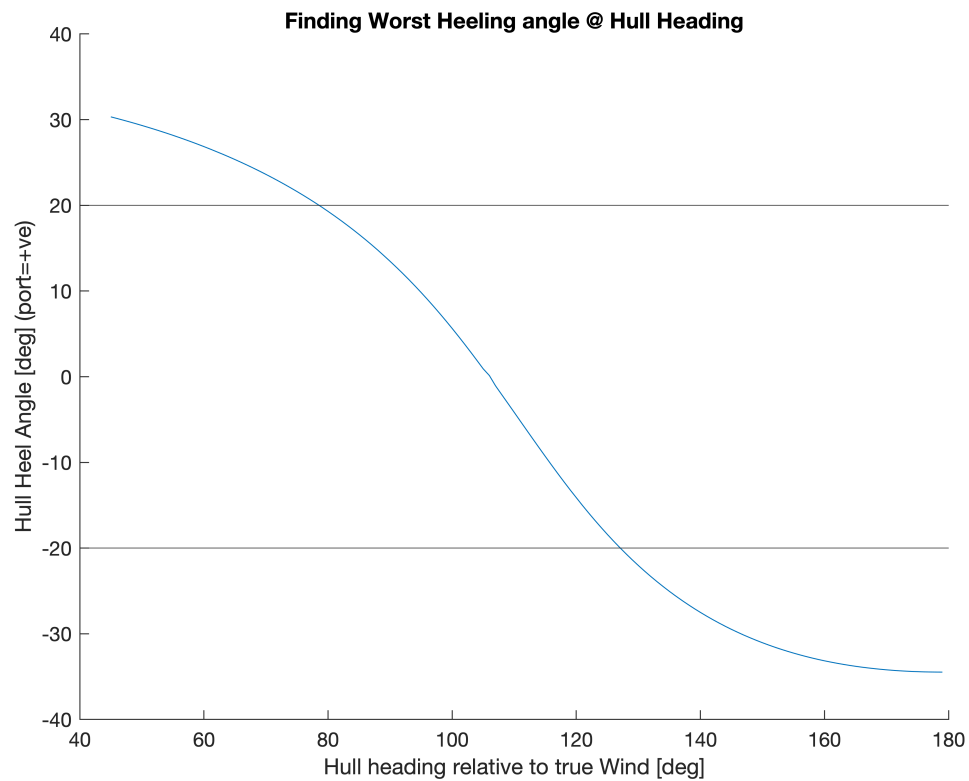
Keel length [m] is 1

Keel weight [kg] is 80

Import Airfoil Data

Where is the worst heel angle?

Iterating through headdings to find worst heeling angle, at highwst wind speed



Finding worst heeling angle heading

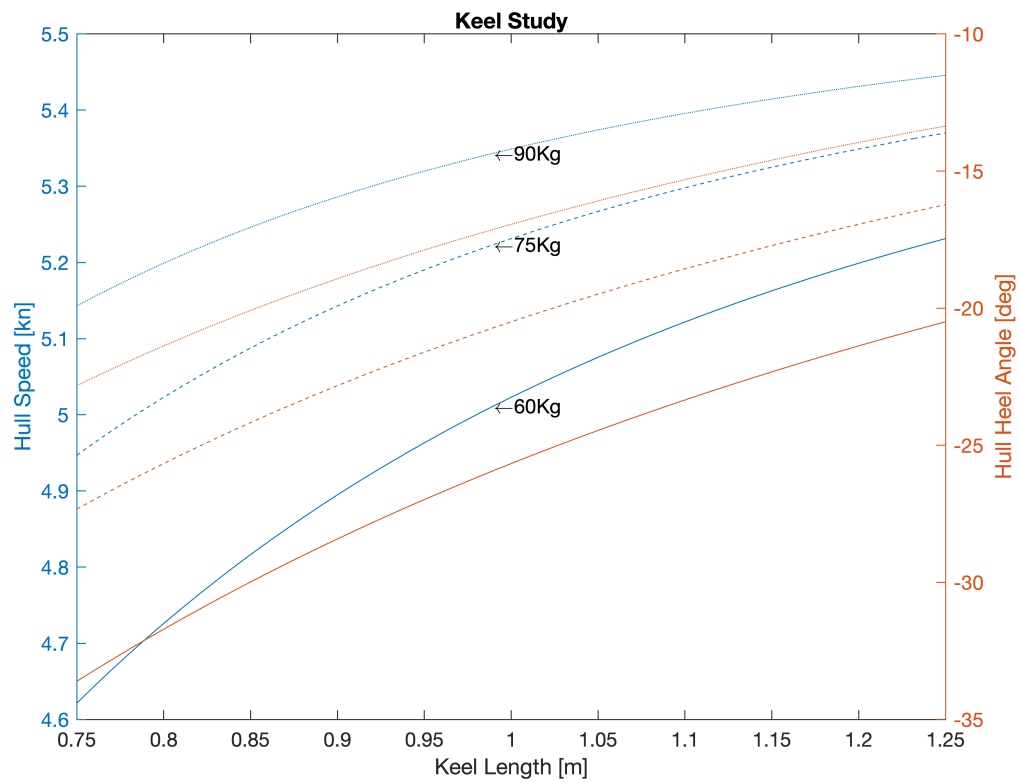
worst_heeling_angle = -34.4715

occurring at

worst_heeling_angle_heading = 179

Keel Study - Length

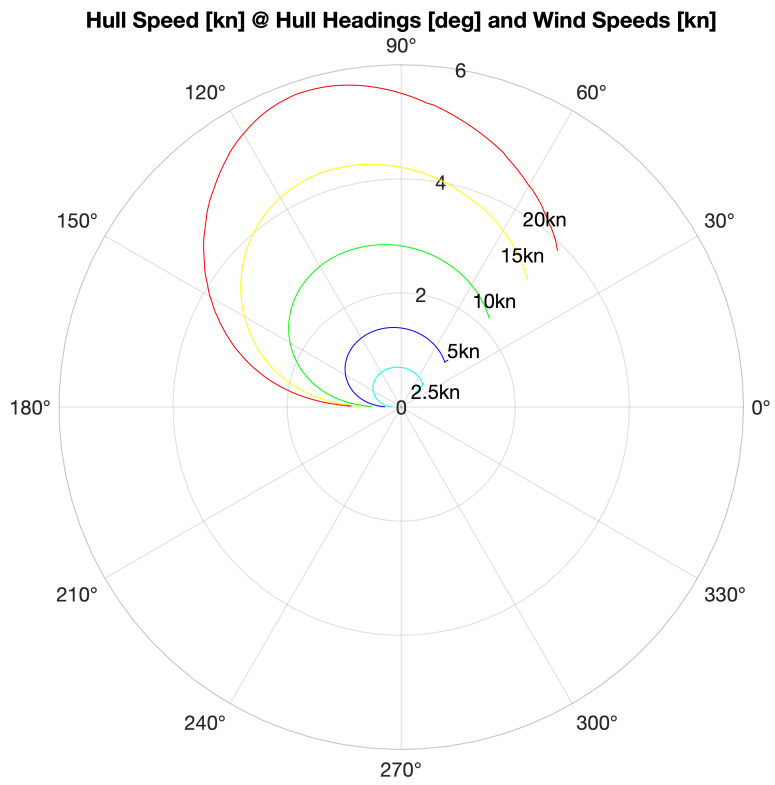
Here we investigate the variance of keel parameters on the performance. We choose a heading of 126deg (20deg of heel in the previous plot), and max wind speed (20kn)



Above we notice that for downwind sailing (+126deg) we need a much heavier keel to make a difference in the heeling characteristics

Polar Plot

Iteration to find boat speed based on wind speed and heading relative to wind



Finding optimal sailing heading

ans = 107