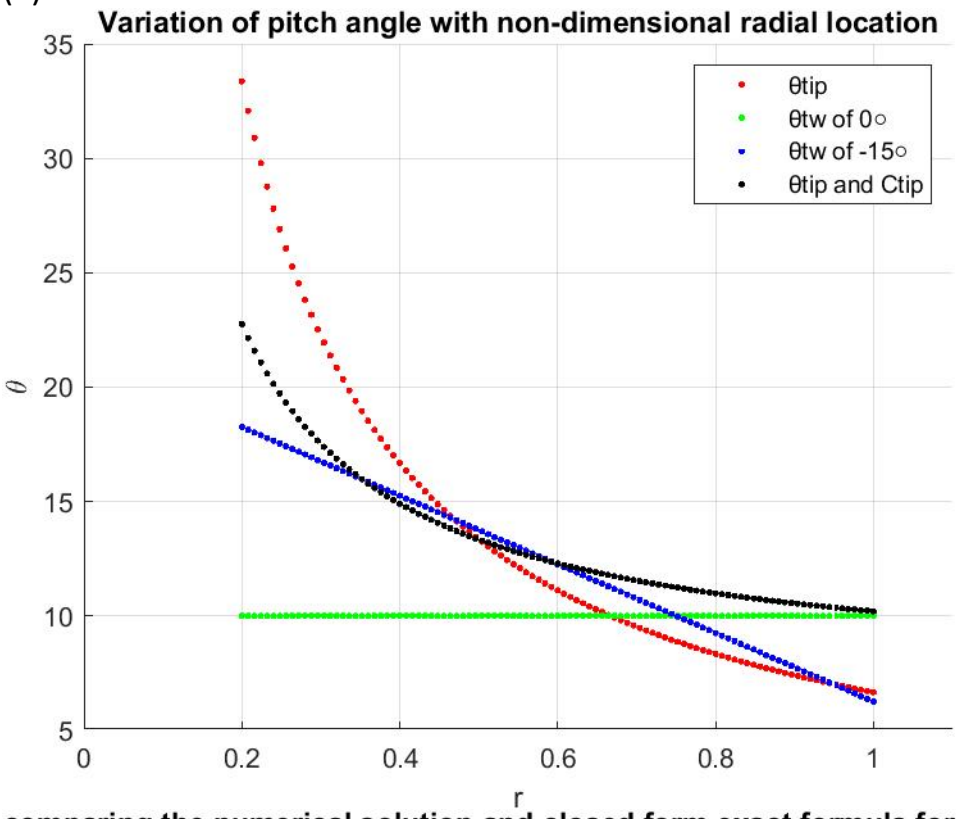
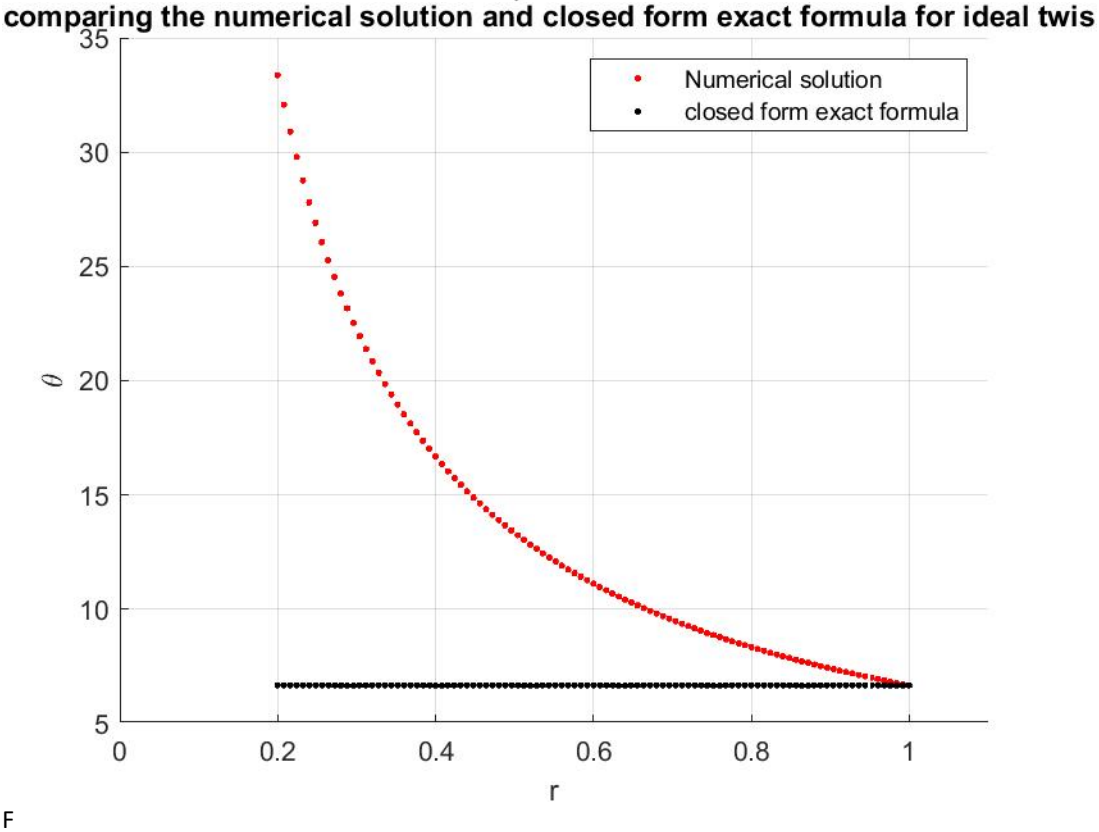
Question 1.

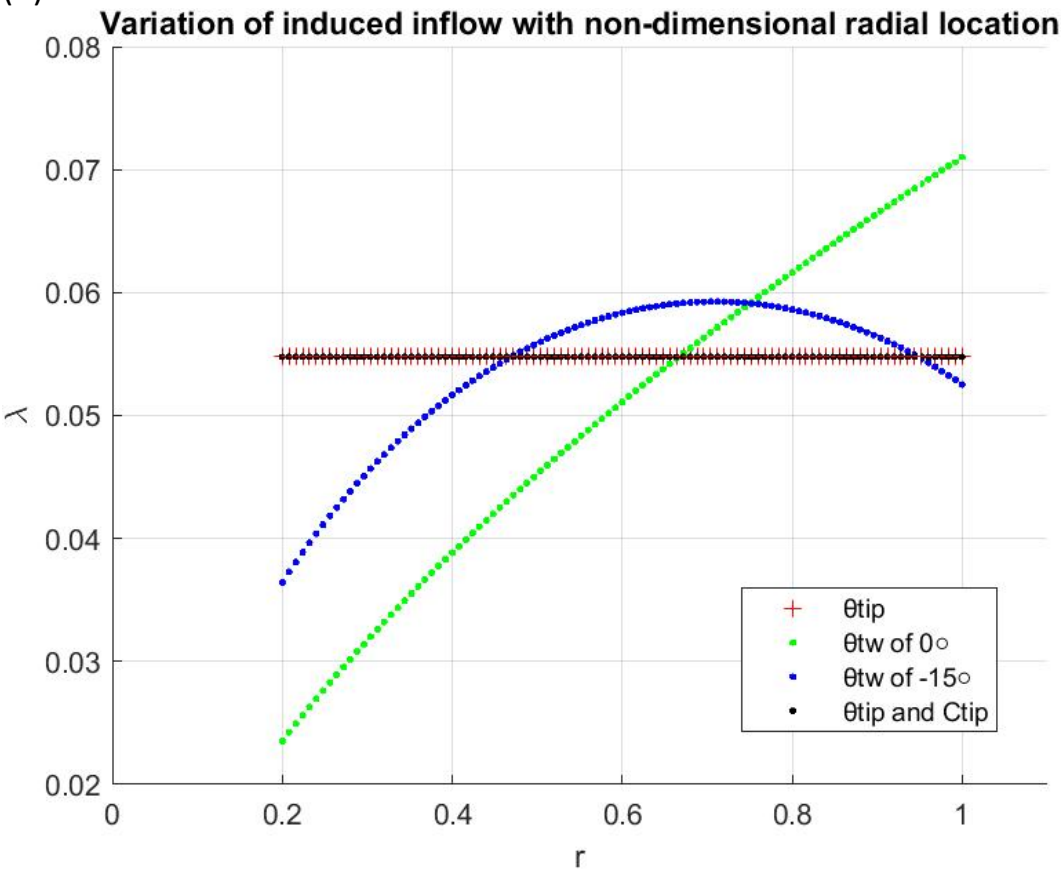
(a)



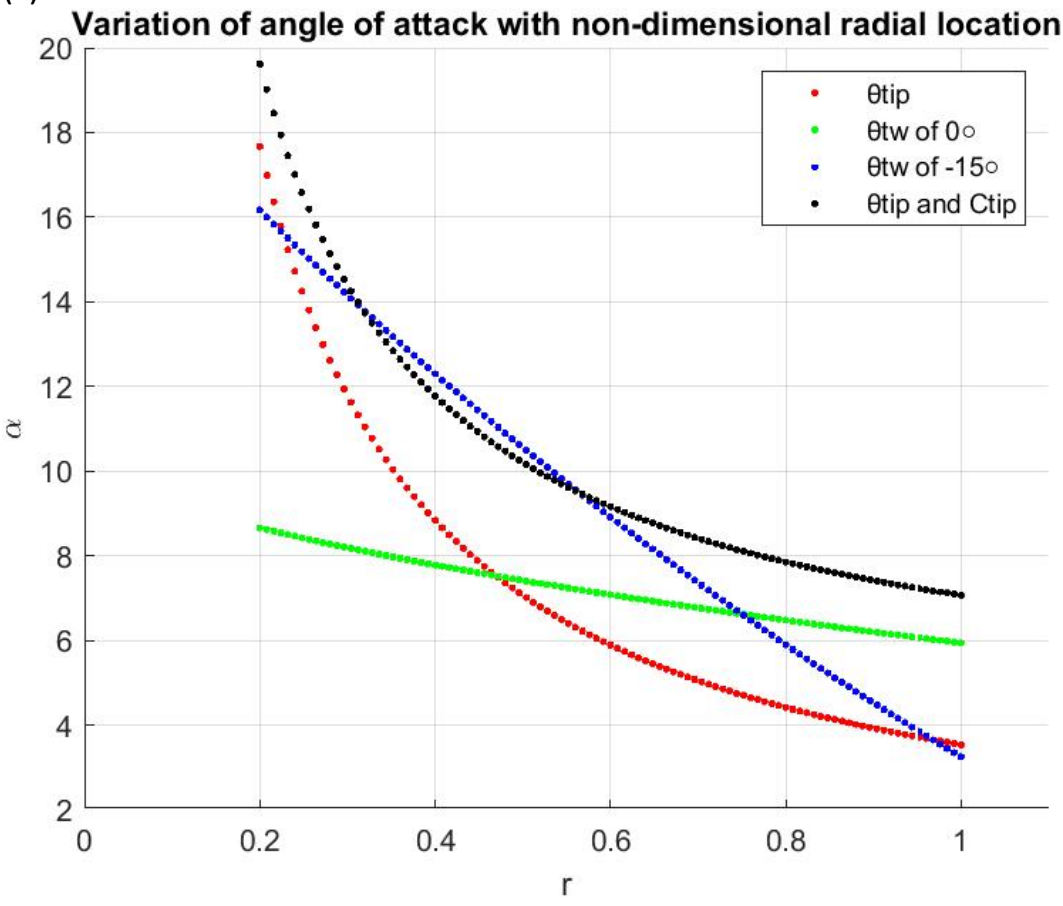


F

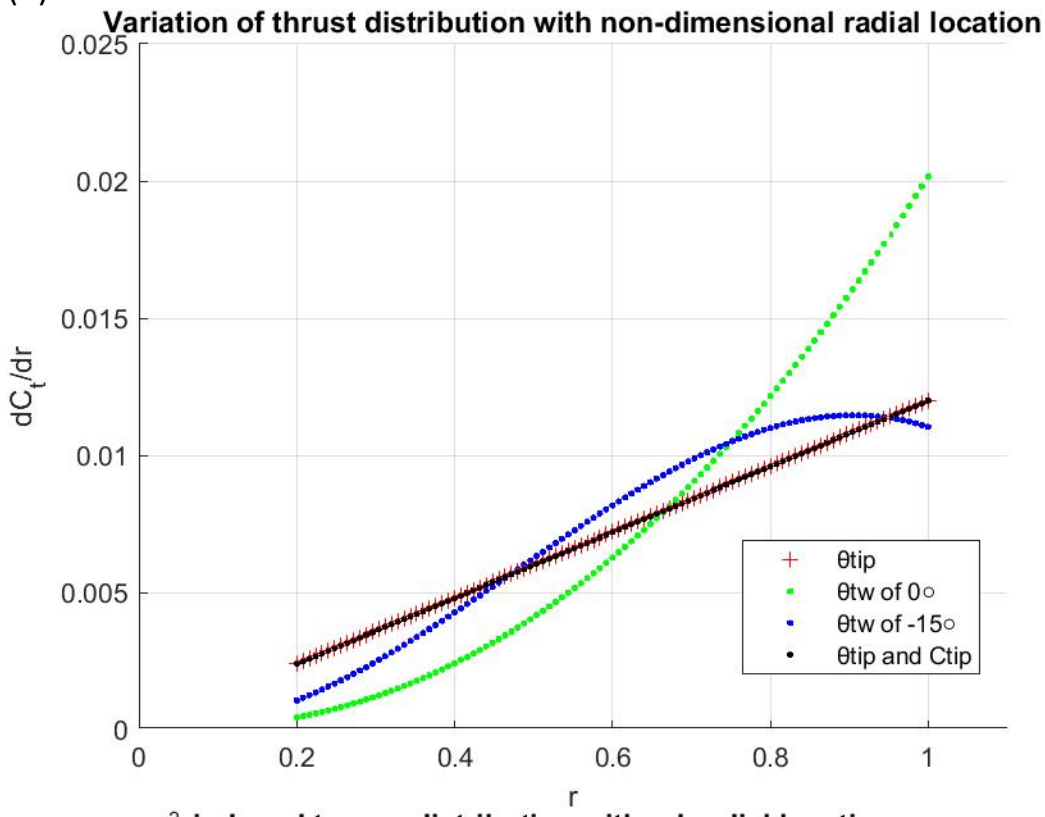
(b)

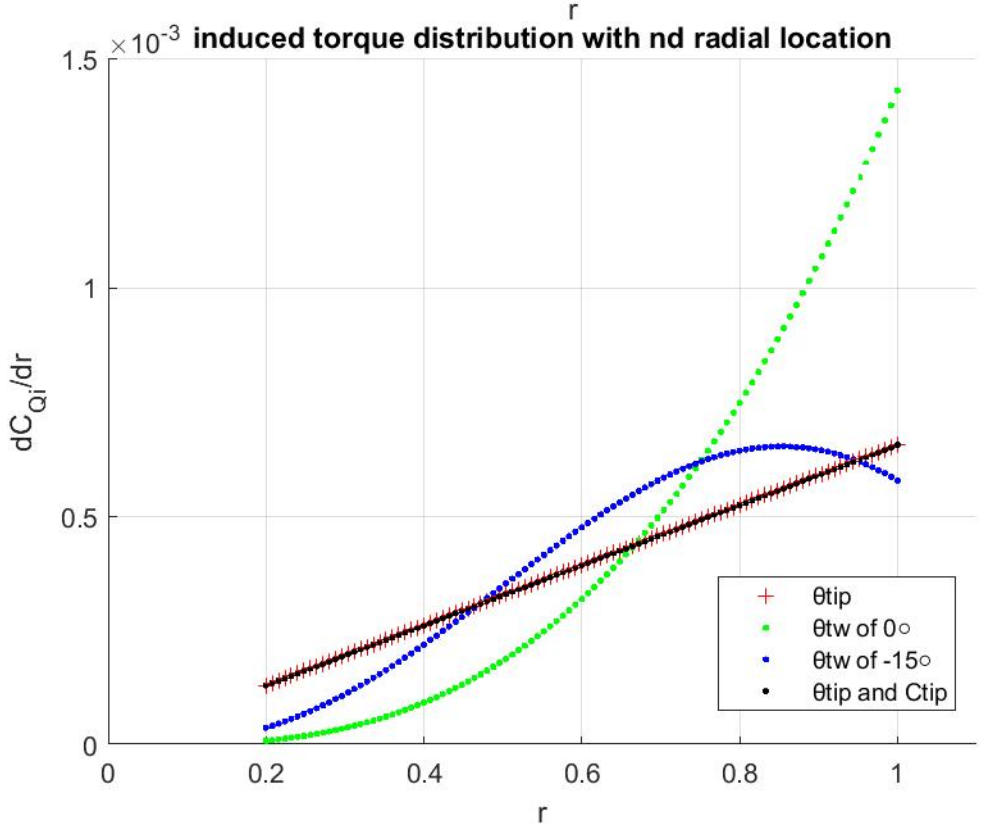

Variation of induced inflow with non-dimensional radial location
λ
r
θtip
θtw of 0○
θtw of -15○
θtip and Ctip

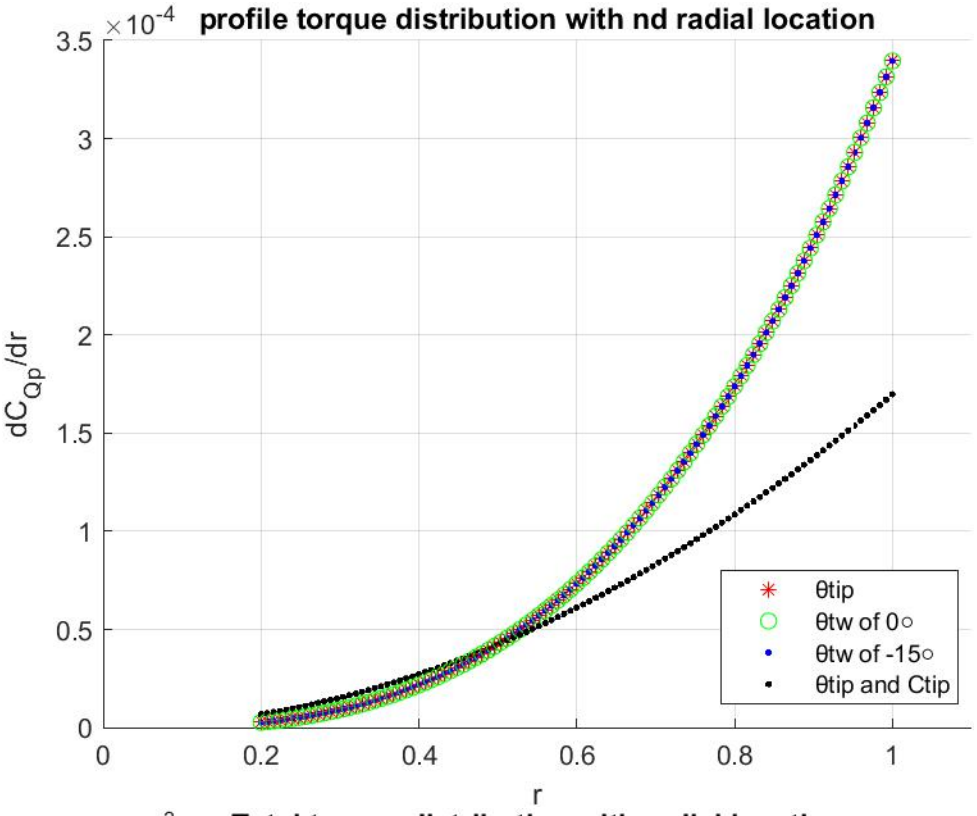
(c)

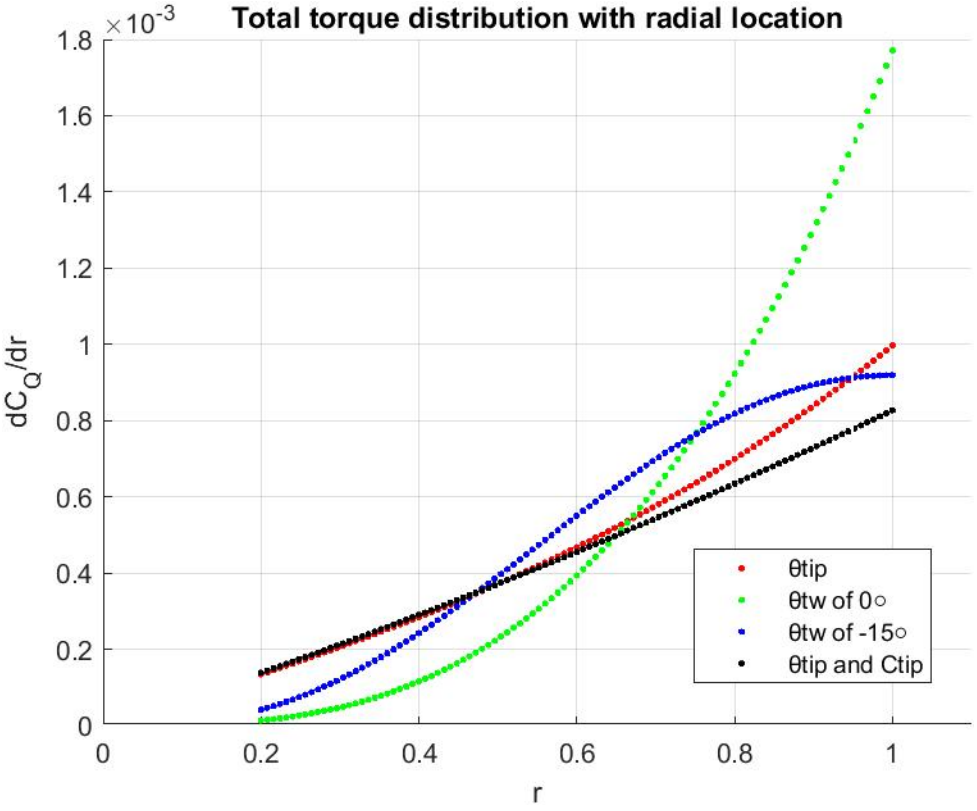

Variation of angle of attack with non-dimensional radial location
α
r
θtip
θtw of 0○
θtw of -15○
θtip and Ctip

(d)

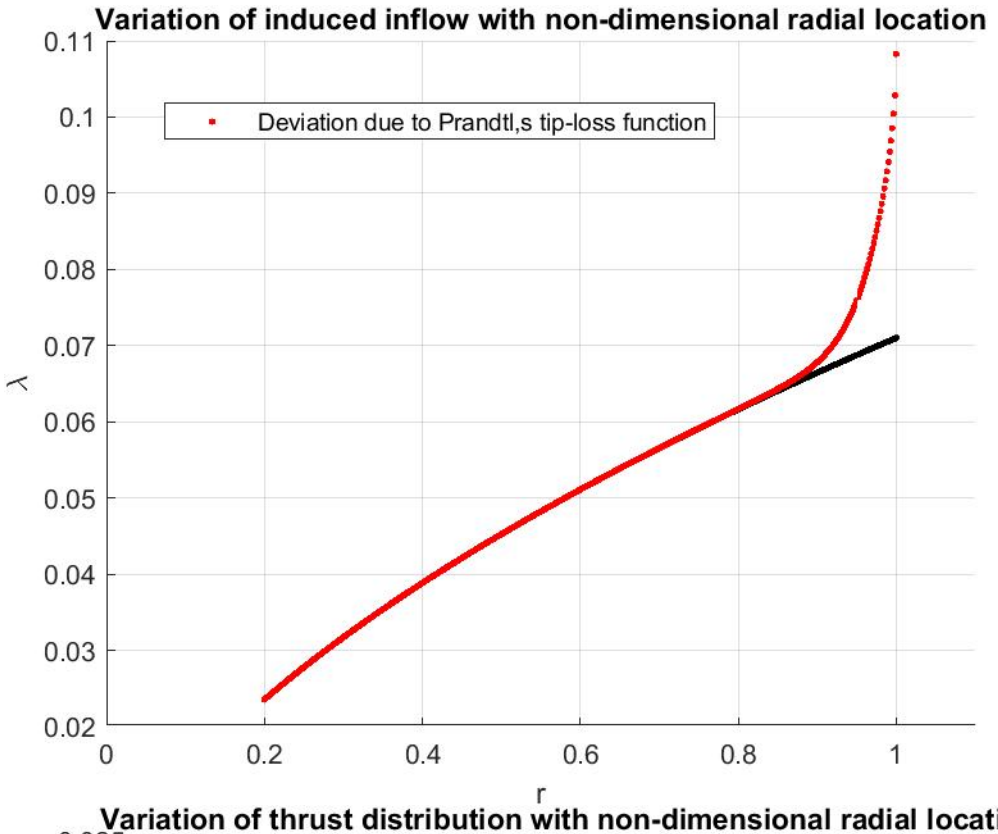

Variation of thrust distribution with non-dimensional radial location
0.025
0.02
0.015
0.01
0.005
0
dC_t/dr
0
0.2
0.4
0.6
0.8
1
r
θtip
θtw of 0○
θtw of -15○
θtip and Ctip

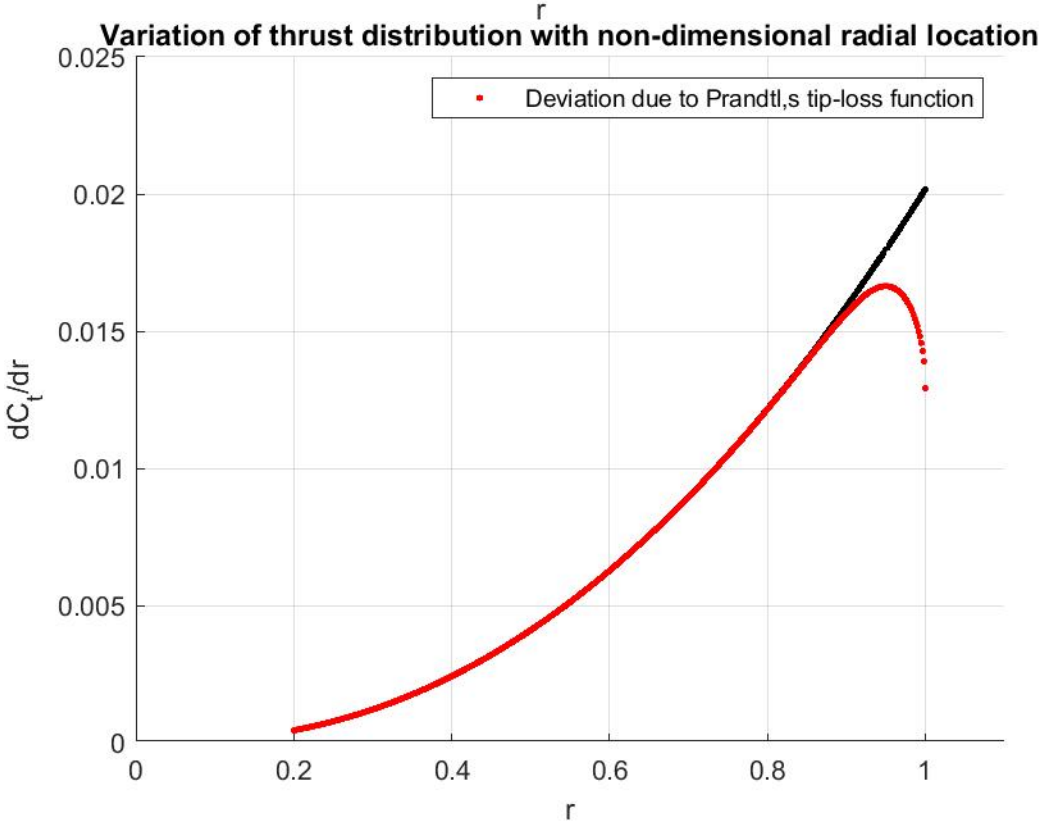

×10^-3
induced torque distribution with nd radial location
1.5
1
0.5
0
dC_Qi/dr
0
0.2
0.4
0.6
0.8
1
r
θtip
θtw of 0○
θtw of -15○
θtip and Ctip

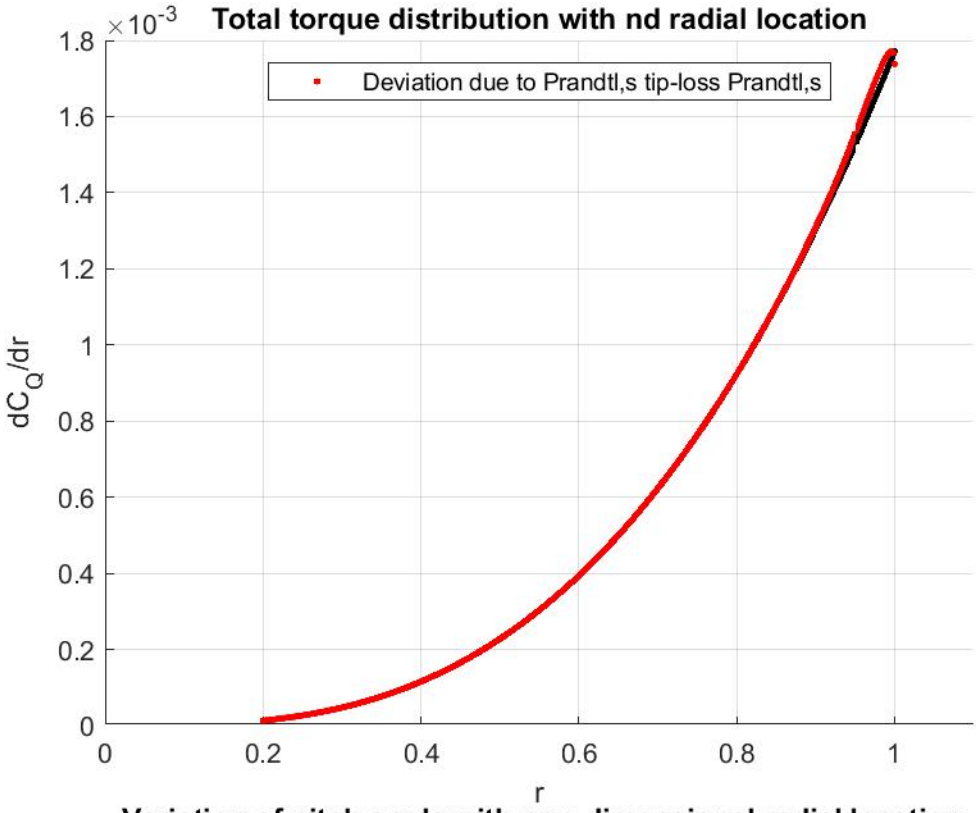

profile torque distribution with nd radial location
×10^-4
dC_Qp/dr
r
θtip
θtw of 0○
θtw of -15○
θtip and Ctip

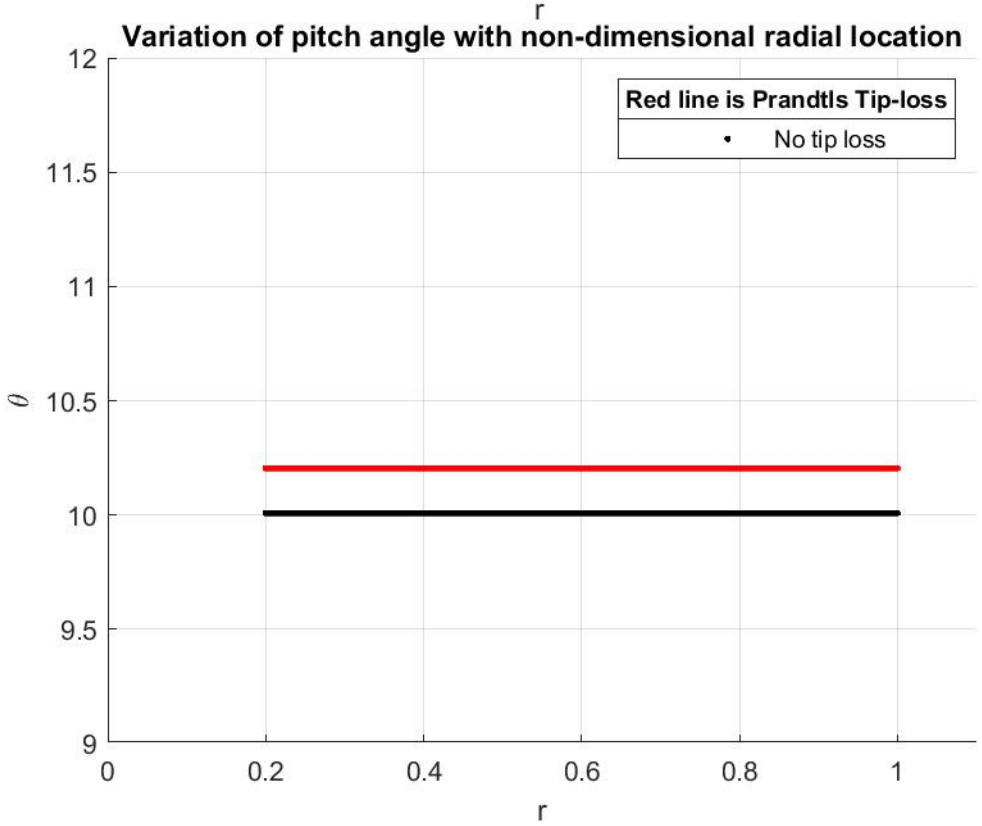

Total torque distribution with radial location
×10^-3
dC_Q/dr
r
θtip
θtw of 0○
θtw of -15○
θtip and Ctip

Question 2.


Variation of induced inflow with non-dimensional radial location
Deviation due to Prandtl,s tip-loss function
λ
r
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0
0.2
0.4
0.6
0.8
1


Variation of thrust distribution with non-dimensional radial location
Deviation due to Prandtl,s tip-loss function
dC_t/dr
r
0.025
0.02
0.015
0.01
0.005
0
0
0.2
0.4
0.6
0.8
1


Total torque distribution with nd radial location
×10^-3
Deviation due to Prandtl,s tip-loss Prandtl,s
dC_Q/dr
r
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8


Variation of pitch angle with non-dimensional radial location
Red line is Prandtls Tip-loss
No tip loss
θ
r
9
9.5
10
10.5
11
11.5
12
0
0.2
0.4
0.6
0.8
1