

# Evaluation of the Eppler 1210 Airfoil

January 15, 2020

## 1 Introduction

1. show airfoil
2. table of freestream conditions and Re
3. xfoil estimates of:
  - max L/D ratio, and AoA at which this occurs
  - max  $C_l$ , and AoA at which this occurs
  - Note: take both of the above directly from airfoiltools.com, at the closest reynolds number available

## 2 Methodology

1. 4 shots of grid: 1. LE 2. TE 3. near-field for entire shape 4. the entire grid domain. Note: should show T-rex feature that was used
2. table 1: cell count and normal-to-wall spacing used, list BC, list reference values, list submodels chosen (i.e. viscous model), provide numerical scheme and spacial accuracy

## 3 Results

1. plot lift and drag coeff histories for proof of convergence history for ALL Runs (appendix)
2. Table of  $C_l$ ,  $C_d$ , L/D,  $C_m$
3. plots of the items in the table and compared against Xfoil data at the closest Re # (take directly from airfoiltools.com)
4. streamlines and pressure contours to depict flow near airfoil
  - 1 plot for each case
  - use the same contour levels
5.  $y^+$  curves (for  $0^\circ$  AoA case)
6. plot showing turbulent boundary layer development ( $0^\circ$  AoA case)

## 4 Discussion

Is the agreement between your CFD model and XFOIL within this same tolerance level for lift and drag?  
( 10% error bar)

## 5 Conclusion

“I always thought something was fundamentally wrong with the universe” [? ]