Propeller Characterization for QPROP

Measure 5–10 radial stations

Measure airfoil at representative ~80% radius station

1) Wrap fine solder around blade airfoil. Carefully slide off blade without bending.

2) Xerox solder with 500%–800% enlargement onto graph paper. Read off about 25–30 x,y coordinates, bunched at LE as shown. Or, scan and digitize using pixelmap edge–finding software.


4) Scale coordinates to unit chord, rotate to put your chosen reference line horizontal.

Determine airfoil aero–model parameters

1) Compute XFOIL fixed–Re (Type 1) polars at one or more typical Reynolds numbers.
2) Fit parabola to drag polar. Read off CLCD0, CD0, CD2, CLmax, CLmin.
3) Fit straight line to lift curve. Read off CL0, CL_a.
4) REref is the Reynolds number of polar used for curve fits.
5) Assume REexp = −0.5, or estimate using additional polars at other Reynolds numbers.

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