Application of Newtonian Approx.

\[ C_p = K \sin^2 \theta \]

\[ k = C_{p_{\text{max}}} \text{ or } 2 \text{ or other empirical.} \]

For general geometries, and in 3D, easier to work with surface normal.

\[ y \cdot \hat{n} = |u| \cos \phi = |u| \sin \left( \frac{\pi}{2} - \phi \right) = |u| \sin \theta. \]

So \[ \sin \theta = \frac{y \cdot \hat{n}}{|u|} \]

\[ C_p = K \left[ \frac{u \cdot \hat{n}}{|u|} \right]^2 \]

Applied to flat plate to get \( L \& D \) by Anderson p 51.

Integrate pressure over surface.

For homework, integrate over some surfaces and compare results to Clark & Trimmer, AEDX-7R-64-25.

Equation above same as C\&T eqn (5).

Note C\&T work in body-fixed coordinates, axial & normal force, not in cards relative to y (L\&D).