Leading Edge Tape

Humidity Dependence

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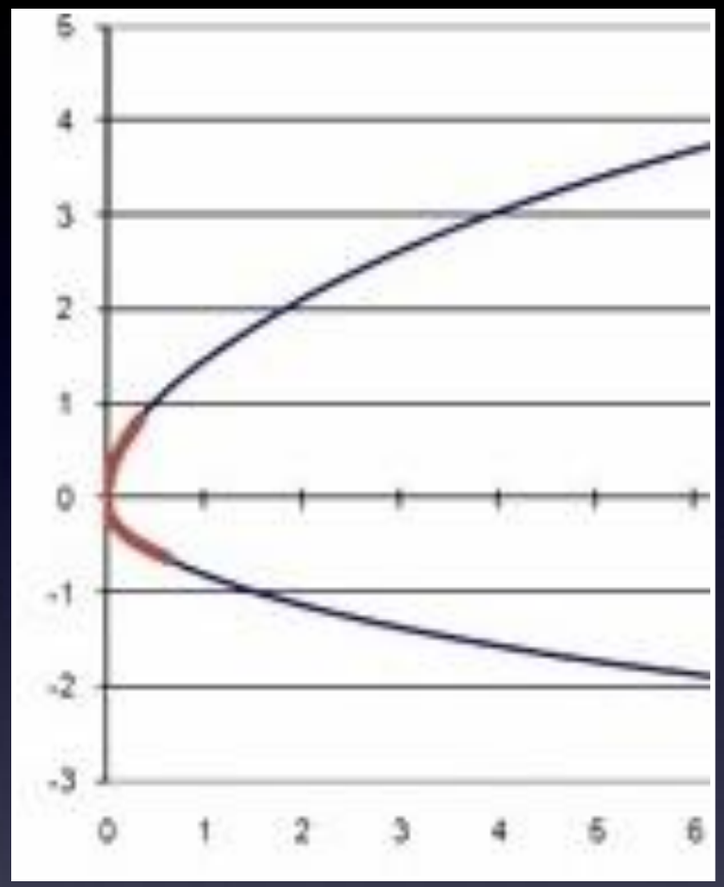
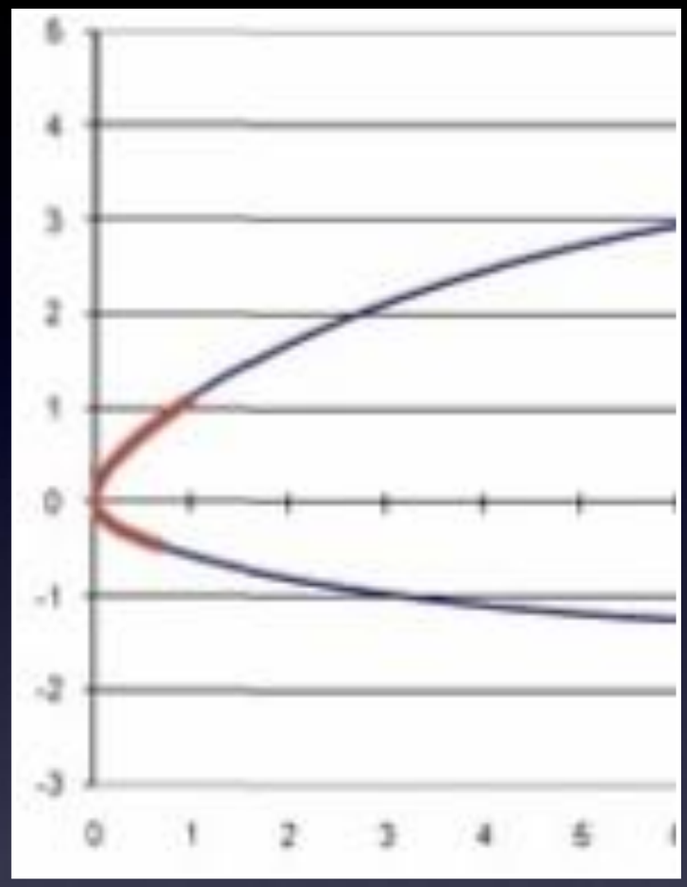
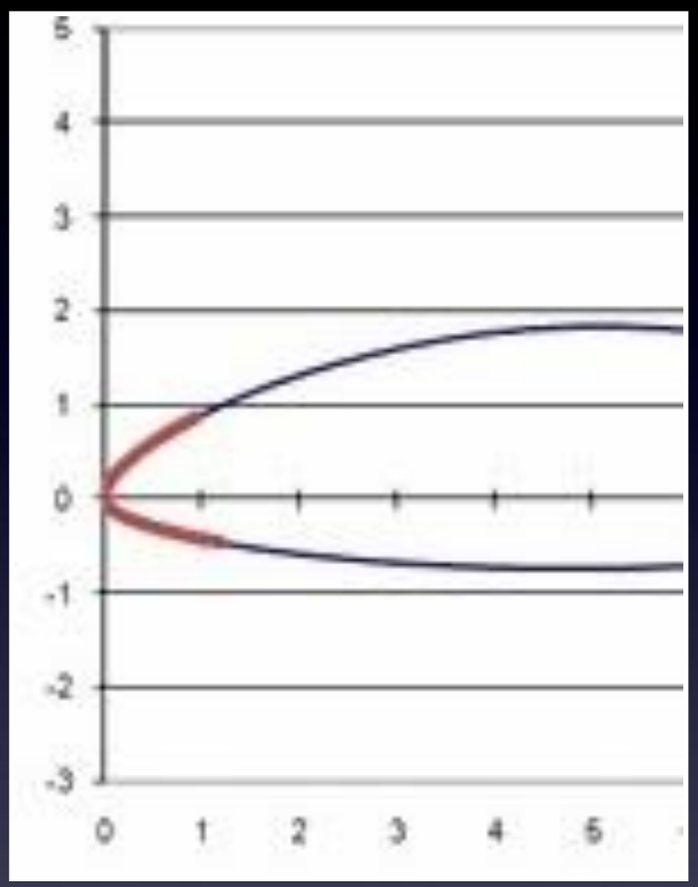
Position of Tape



Wing Root



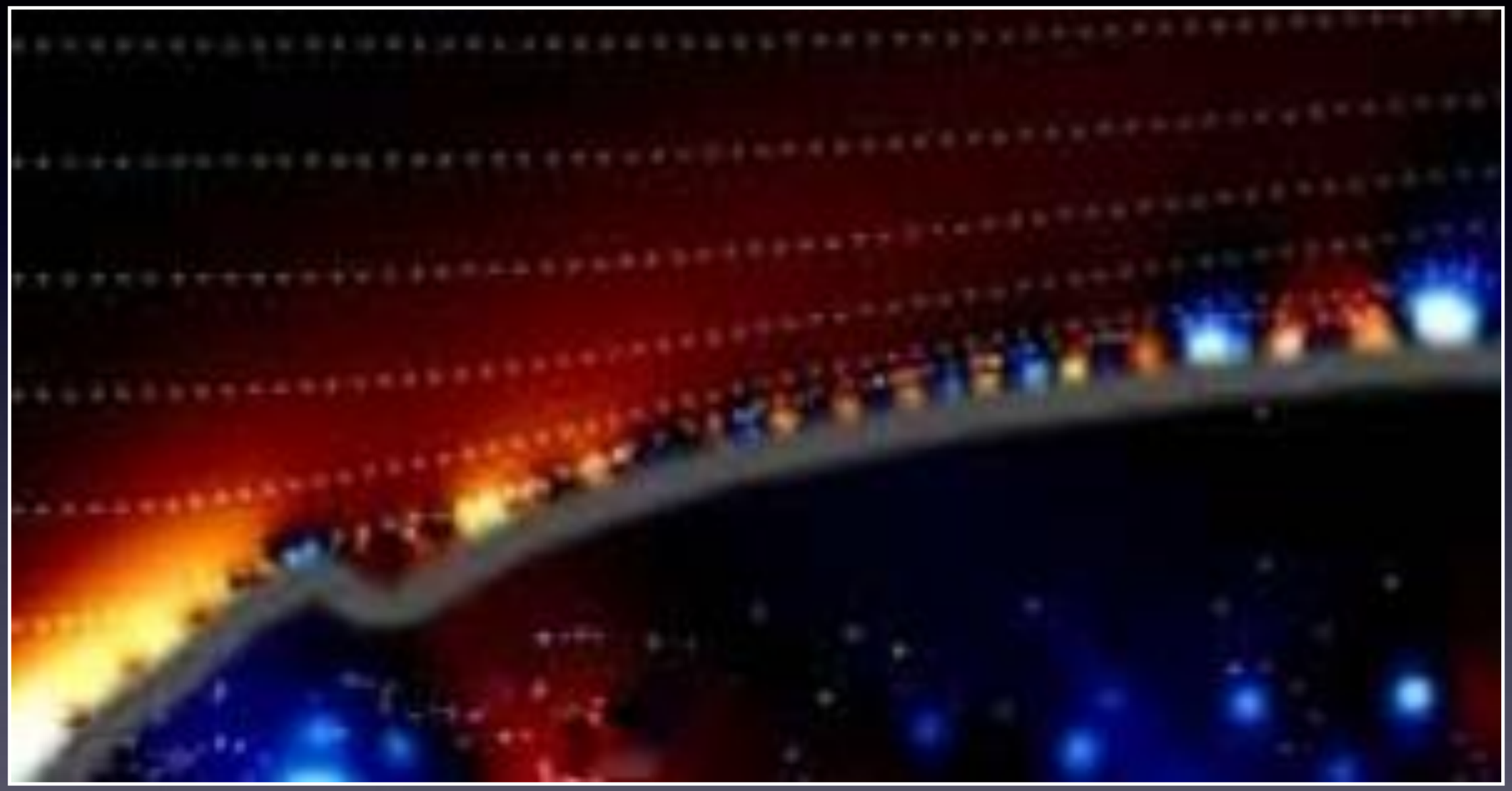
Inboard End of Aileron



Wing Tip

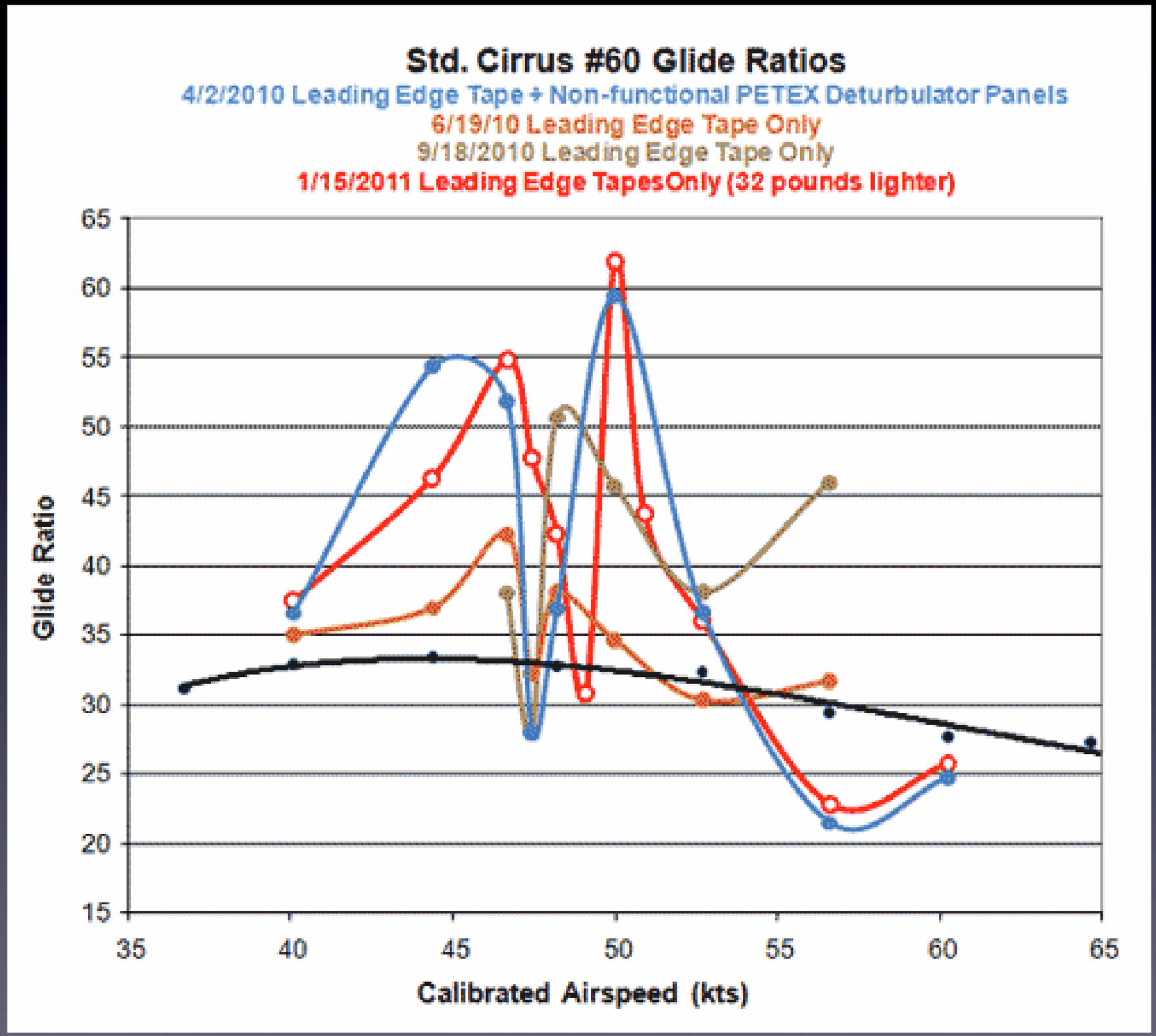
Tape Thickness: .0025"

Demonstration of Hypothetical Vortical Separation Layer

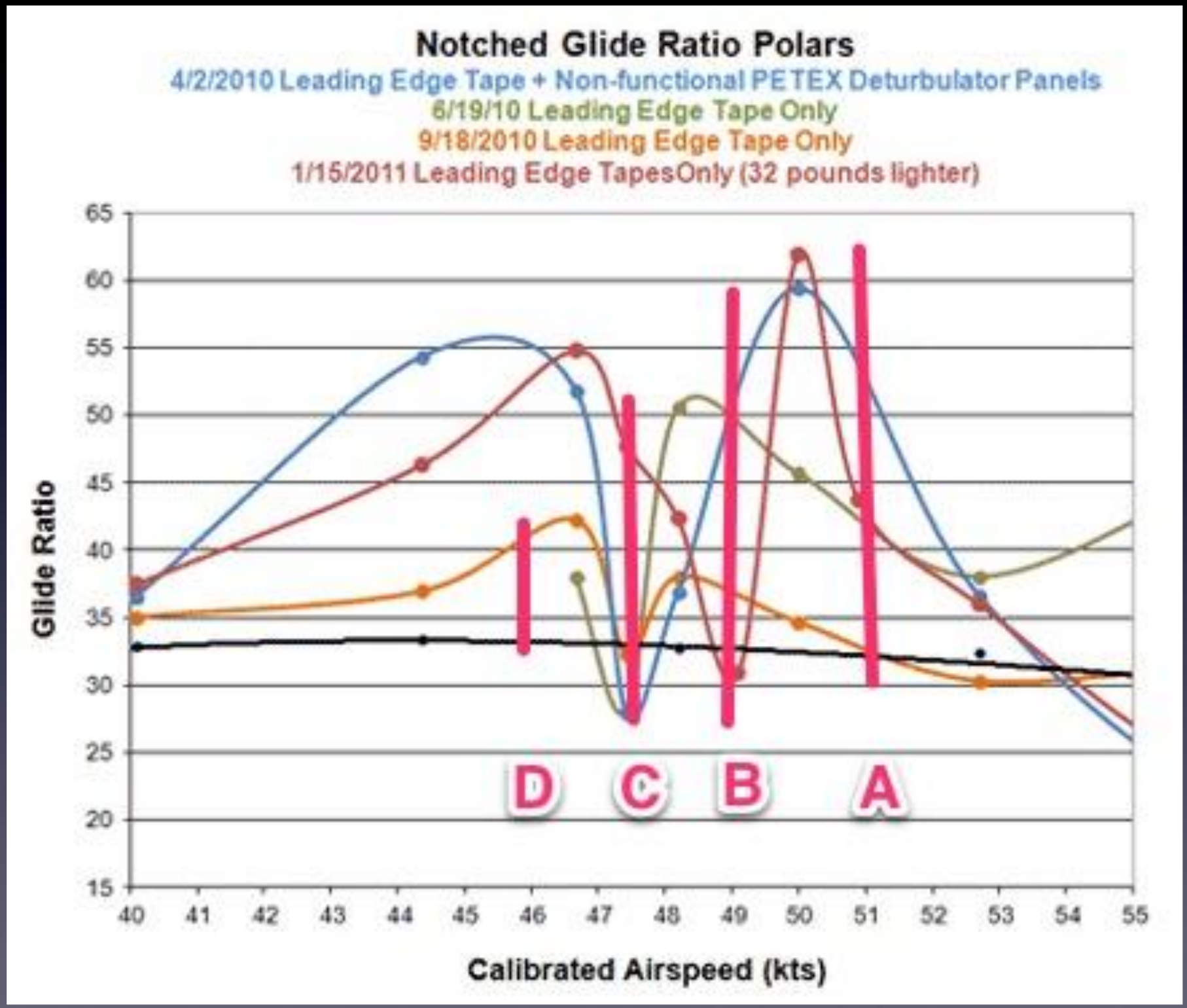


This is not a realistic simulation. It is only a demonstration of the sort of vortical flow that is postulated.

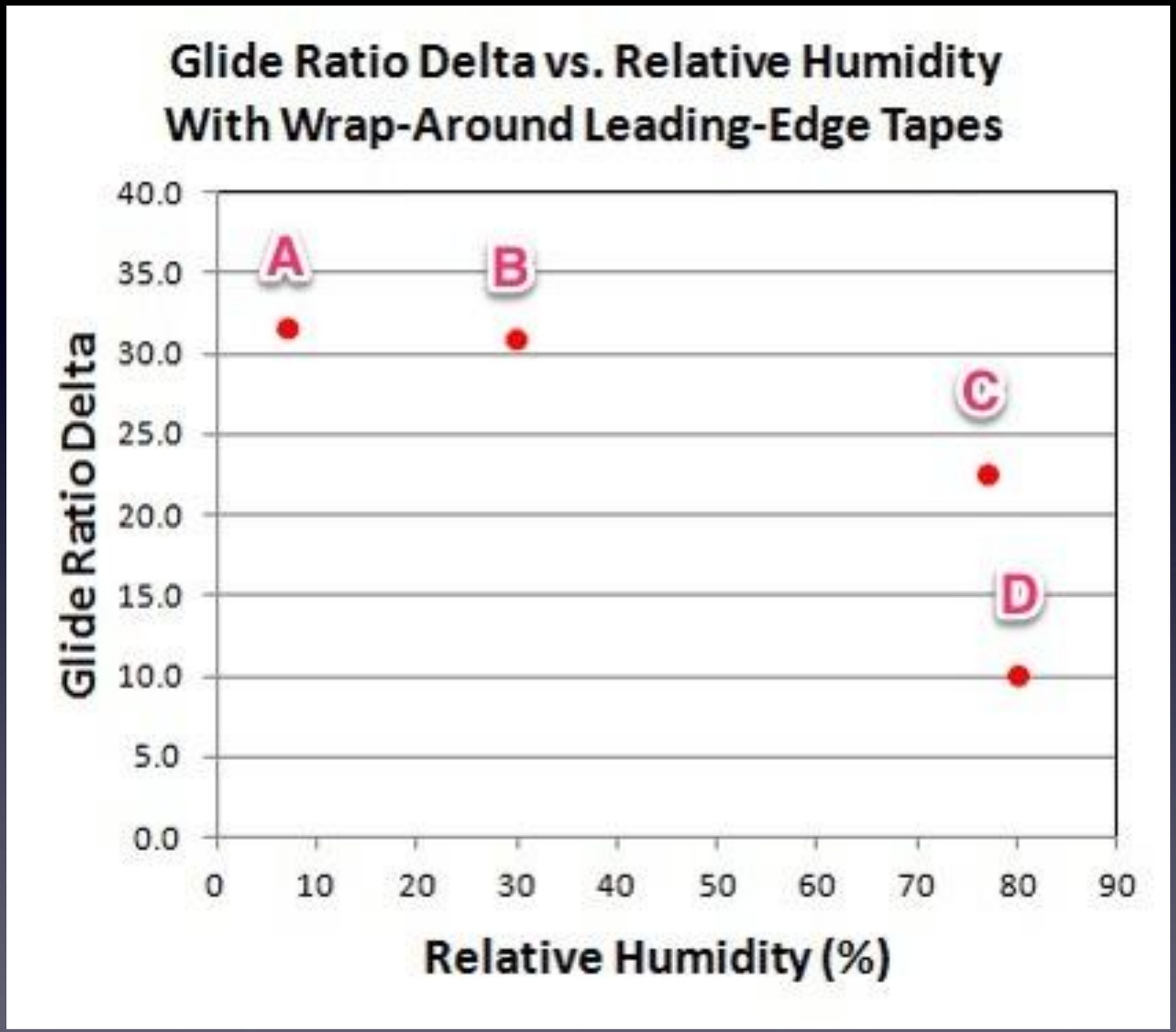
Four Glide-Ratio Measurements



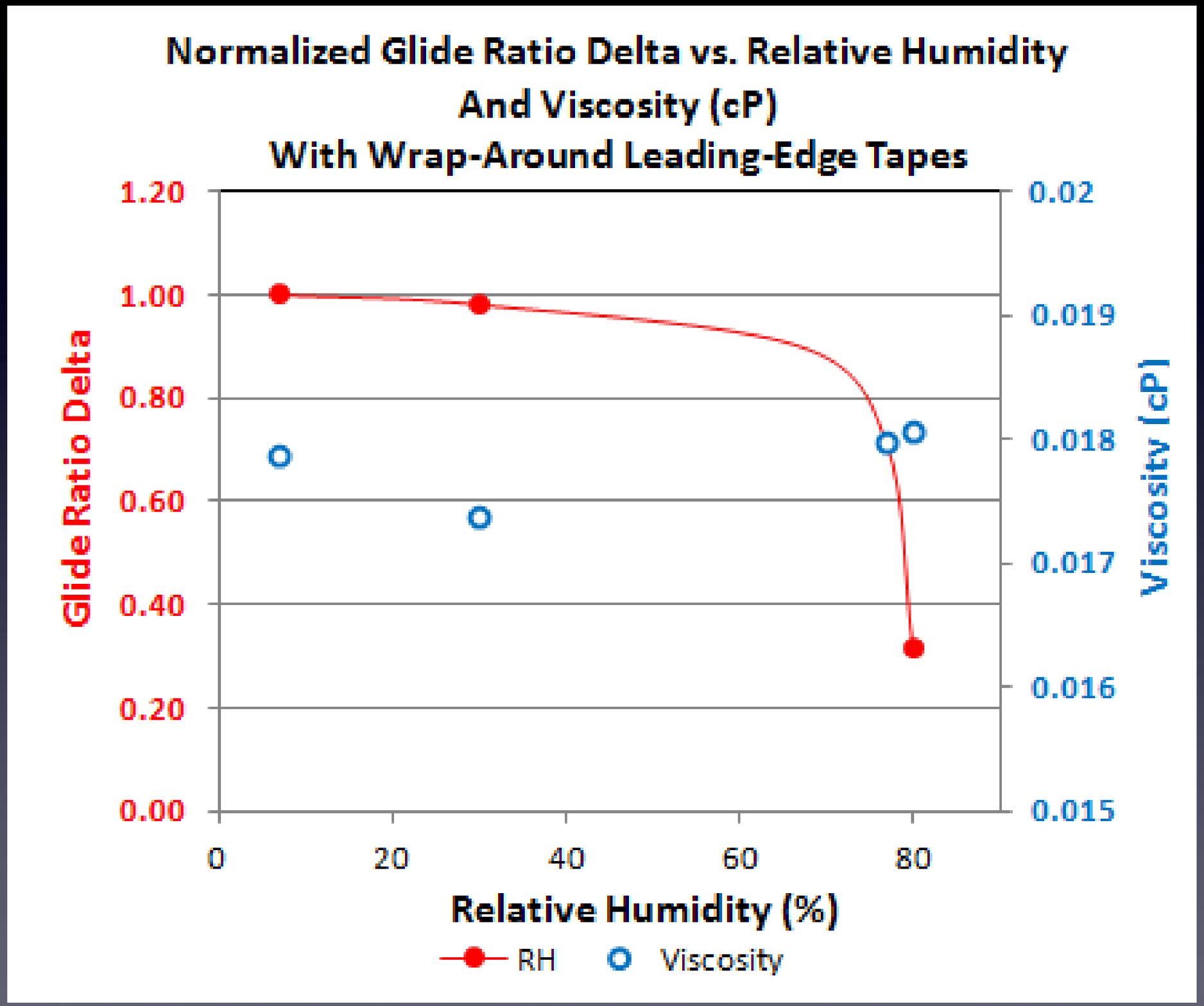
Amplitude Deltas



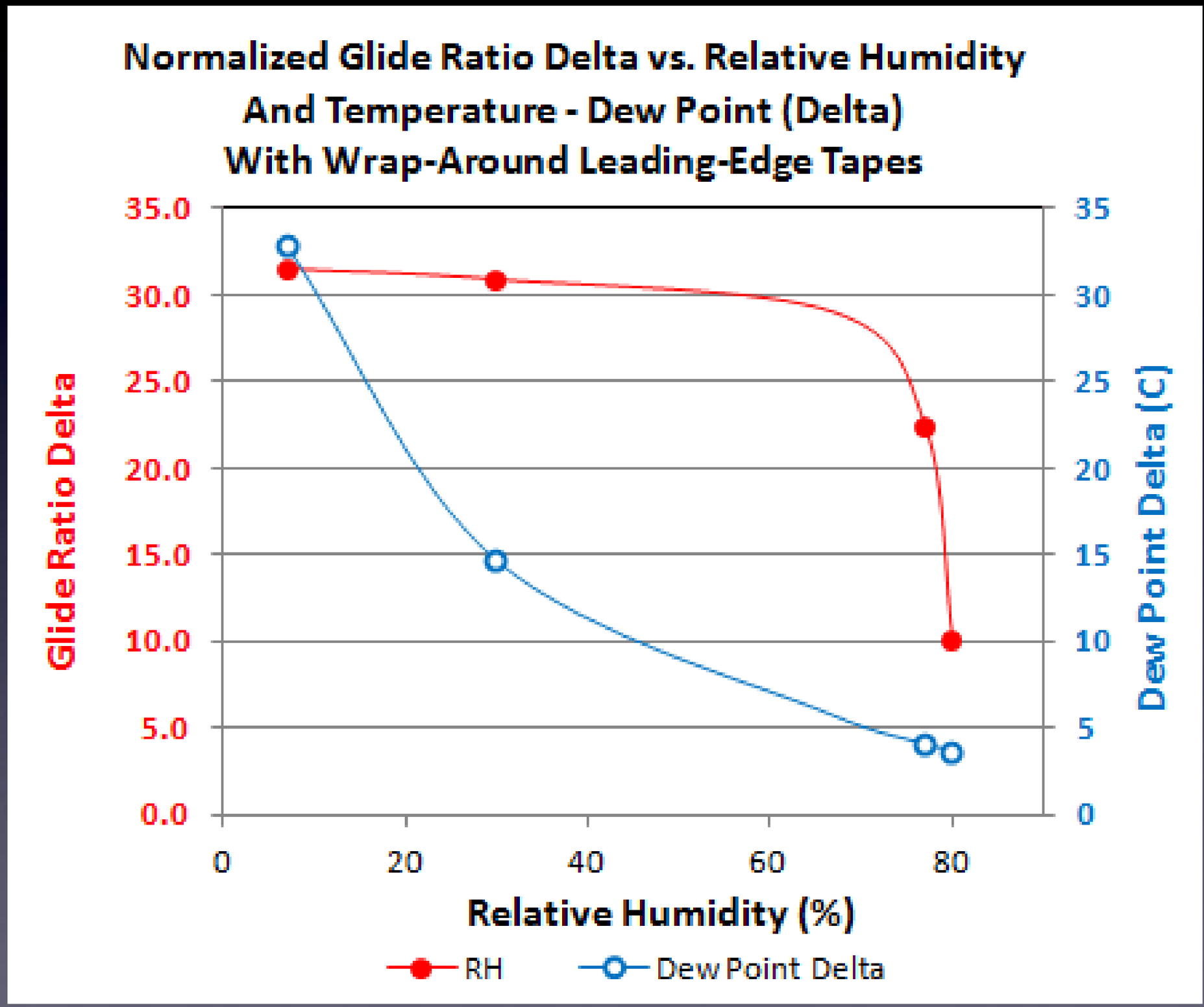
Humidity Dependency



No Viscosity Correlation



(Temperature - DewPoint) Correlation



Observations

- The large swings resulting from an upper surface rear-facing step diminish sharply when relative humidity exceeds 75%.
- This is thought to be due to a failure to generate a thin (.0025") bed of rolling vortexes that maintains detached flow.
- The tiny vortices require large surface friction values on the wing surface behind the tape.
- Viscosity does not correlate with performance amplitude deltas, but proximity of air temperature and dew point temperature does.
- The performance delta falls off sharply when the air temperature is within 4 degrees F of the dew point temperature...near saturation.
- Since viscosity does not correlate, this implies a skin friction loss.

End