Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

A potential method for lift evaluation from velocity field data
GUILLAUME DE GUYON-CROZIER, KAREN MULLENERS, Ecole Polytechnique Federale de Lausanne — Computing forces from velocity field measurements is one of the challenges in experimental aerodynamics. This work focuses on low Reynolds flows, where the dynamics of the leading and trailing edge vortices play a major role in lift production. Recent developments in 2D potential flow theory, using discrete vortex models, have shown good results for unsteady wing motions. A method is presented to calculate lift from experimental velocity field data using a discrete vortex potential flow model. The model continuously adds new point vortices at leading and trailing edges whose circulations are set directly from vorticity measurements. Forces are computed using the unsteady Blasius equation and compared with measured loads.

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Date submitted: 13 Jul 2017 Electronic form version 1.4