# OVERFLOW Contribution to HiLiftPW-3

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We intend to participate in the HiLiftPW-3, to be held June 3-4, 2017 in Denver, CO. We plan to perform the following sets of computations:

For all our contributions (except where stated) Code: OVERFLOW, Turbulence model: SA-neg--RC-QCR2000

1. Results will be submitted for both the full chord flap gap (Case 1a) and partially-sealed Chord Flap gap (Case 1c).
    1. Grid Refinement Study
    2. Grids: structured overset grids supplied by HiLiftPW committee
    3. Connectivity: Domain Connectivity Framework, DCF
2. Results will be submitted for JAXA Standard Model and Nacelle/Pylon Off (Case 2a), Nacelle/Pylon On (Case 2c)
    1. Alpha Study
    2. Grids: structured overset grids supplied by HiLiftPW committee
    3. Connectivuty: Pegasus 5 (Peg5)
3. A study of the effects of different connectivity paradigms
    1. DCF vs Peg5 for HL-CRM cases
    2. DCF vs. C3P (NASA Ames) vs. Peg5 for JSM cases
    3. JSM grids will be the focus where we will hopefully see some type of trends w.r.t. wind tunnel data
4. Adaption cases will be attempted for (and submitted where appropriate),
    1. Cases 1c,1d: HL-CRM
    2. Cases 2c and 2d: JSM
    3. Grid: Near Body grids provided by committee, Off- Body grids Cartesian
    4. AMR Near-Body and Off-Body Adaption
5. Case 3 - Turbulence model verification study
    1. Grid: Series of 3 finest grids as defined on http://turbmodels.larc.nasa.gov/airfoilwakeverif.html
    2. Turbulence models: SA-neg and SA-neg—RC-QCR2000

We will submit our results electronically by the deadline to the HiLiftPW committee.

OVERFLOW 2.2 is a Reynolds-averaged Navier-Stokes (RANS) code developed by NASA[1] and is used extensively by the three organizations represented on this abstract. It is a structured, overset solver with a wide variety of discretization schemes, implicit algorithms, and turbulence models. It also has, an automated ARM feature-based adaption using second-order undivided differences. It contains implementations of the Spalart-Allmaras[2] (SA) eddy-viscosity models along with optional streamline rotation/curvature correction (RC)[2] and a quadratic constitutive relation (QCR2000)[2].

**References**

[1] Nichols, R. H. and Buning, P. G., “User’s Manual for OVERFLOW 2.2,” NASA Langley Research Center, Hampton, VA, Aug. 2010.
[2] NASA Turbulence Modeling Resource Website: https://turbmodels.larc.nasa.gov
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