

Flow solver

Updates the flow velocity v from t to $t + dt$

$t \leftarrow t + dt$
Flow velocity $v(t)$

ALM

Flow velocity sampling
Aerodynamic loads

$x(t - \frac{dt}{2}), \dot{x}(t - \frac{dt}{2})$

Forces on blade $F(v(t), x(t - \frac{dt}{2}))$

Structural solver

Updates the beam states (x, \dot{x}) from $t - \frac{dt}{2}$ to $t + \frac{dt}{2}$

Subcycling
(F constant)

Blade displacements $x(t + \frac{dt}{2}), \dot{x}(t + \frac{dt}{2})$

ALM

Flow velocity sampling
Aerodynamic loads
Distribution of the loads

$v(t)$

Forces on LES mesh $f(v(t), x(t + \frac{dt}{2}))$