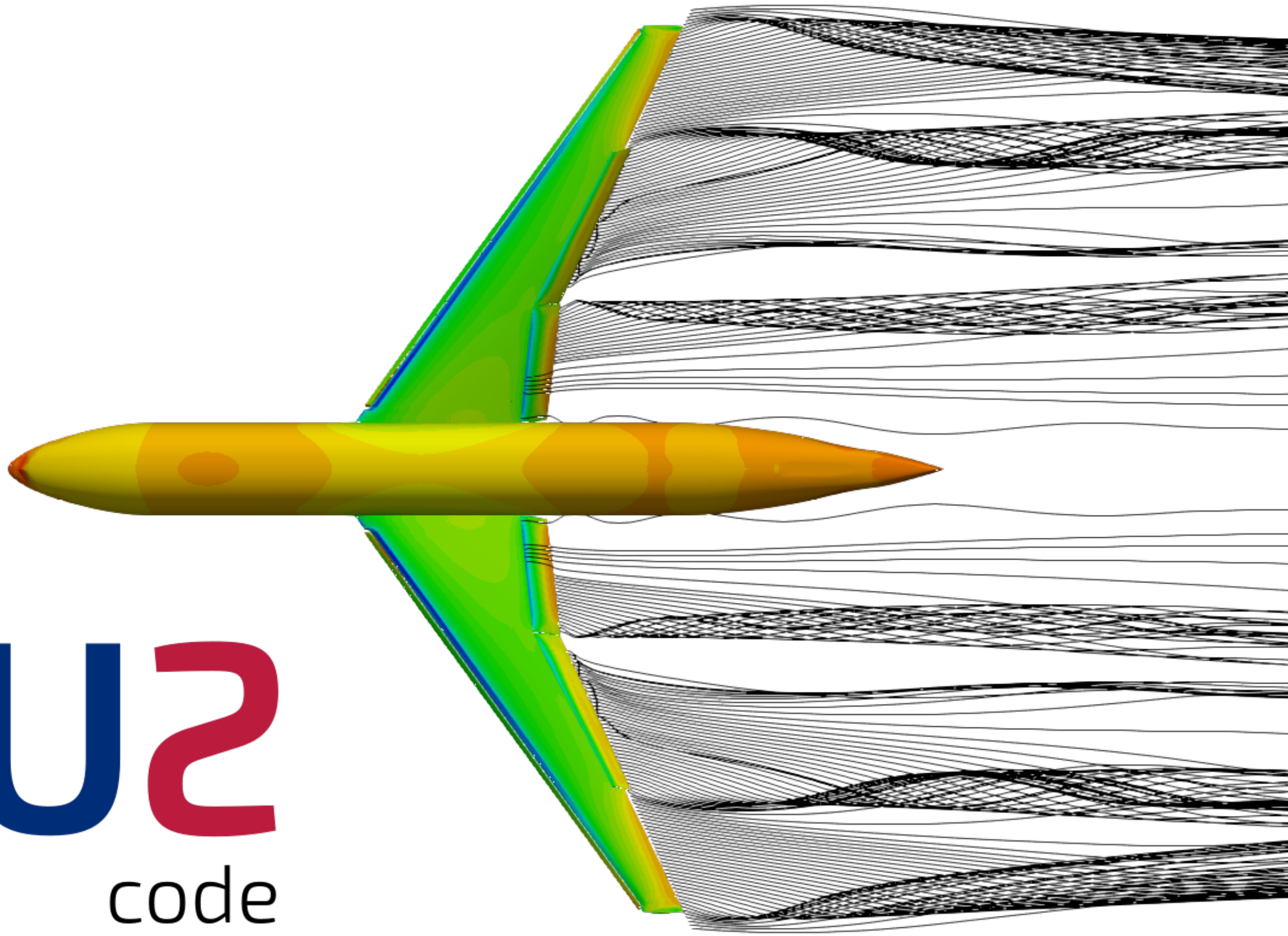


SU2
code

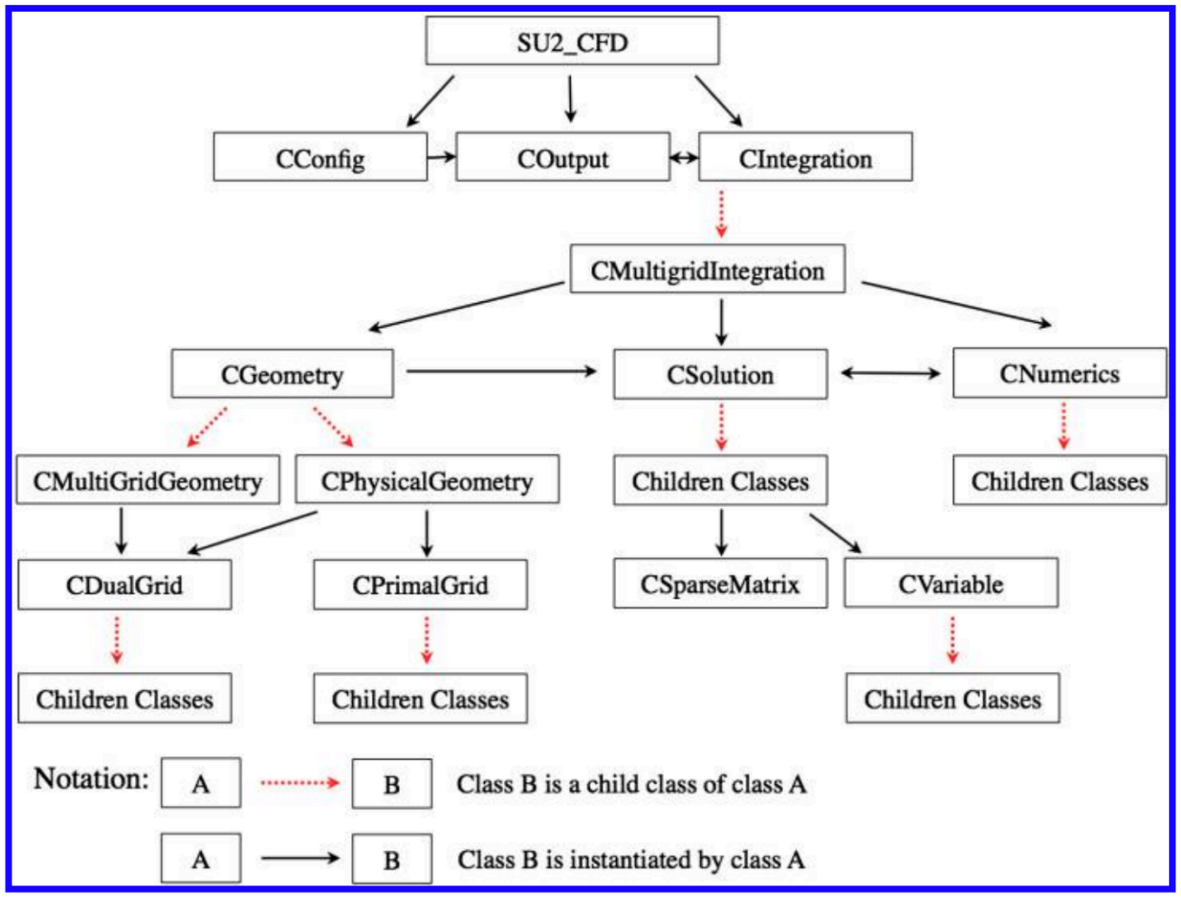
PDE-Constrained Shape Optimization & CFD in C++

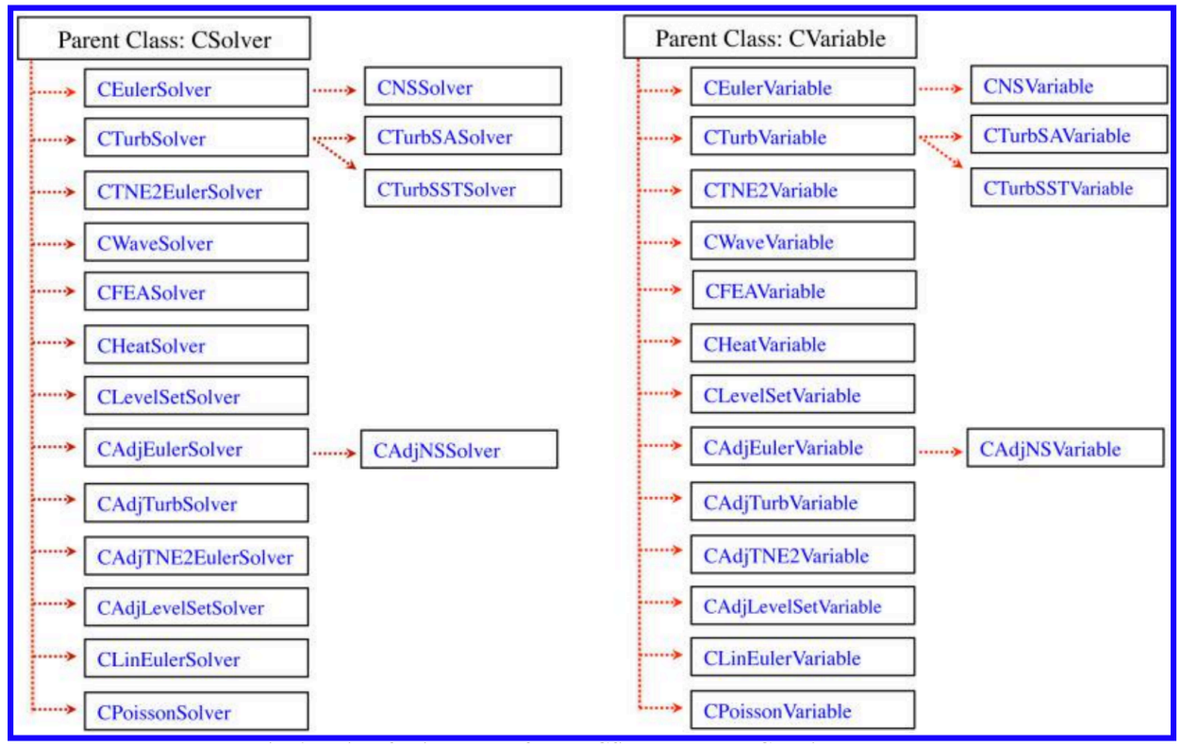
Corey Lynn Murphey, Fall 2021

SU2

What is it?

- Fluids, Structural Mechanics, Elasticity, Reactive Flows
- Spatial Integration: Finite Volume Method
  - Gradients calculated using Green-Gauss or Weighted least squares at all grid nodes
- Time Integration: Default implicit BFD
  - Explicit Euler and explicit RK available

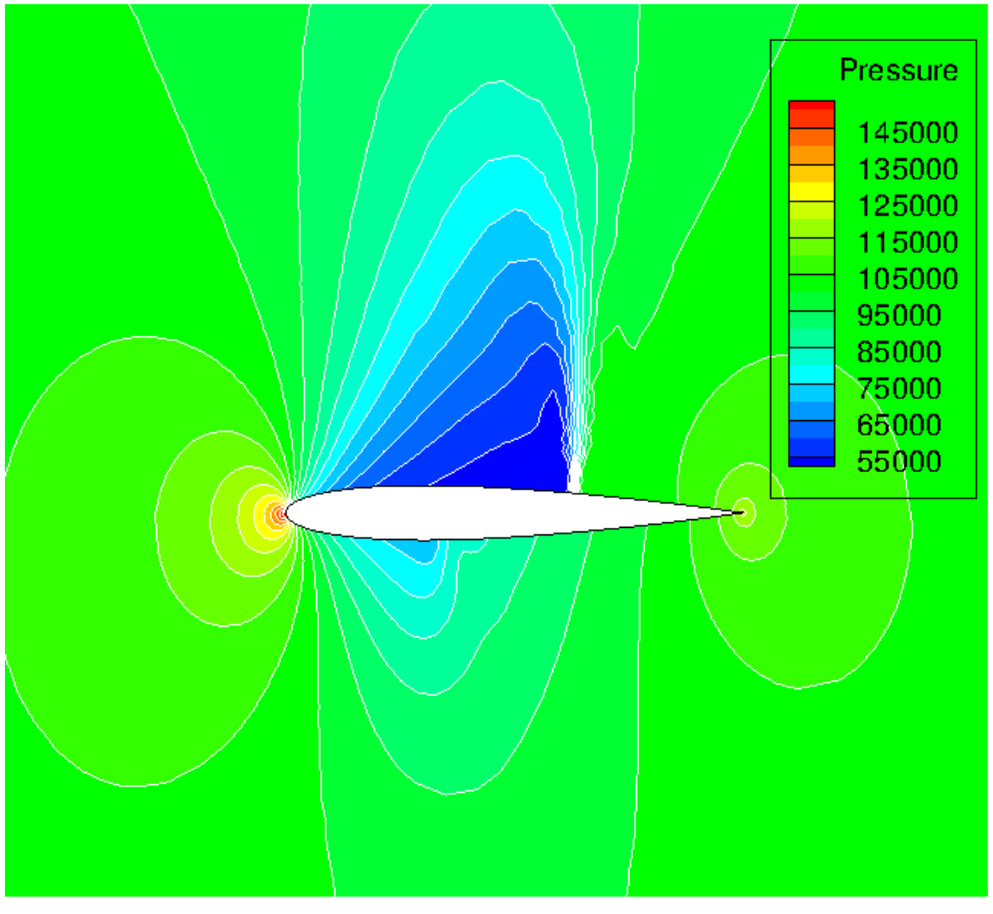




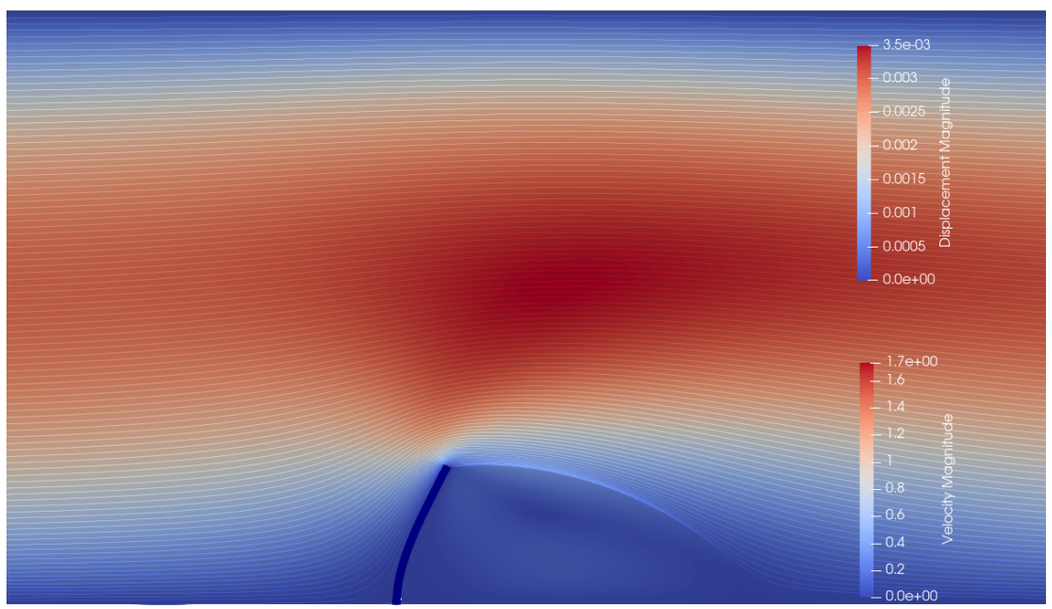
Economon et al., 2015

Applications

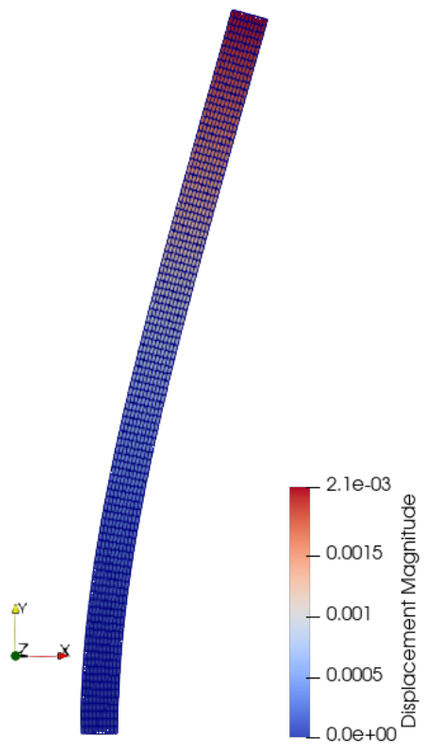
- CFD : Compressible & Incompressible Flow
  - Shape Optimization
- Multiphysics Simulations
- Structural Mechanics



Incompressible Flow over an airfoil



Fluid Structure Interaction

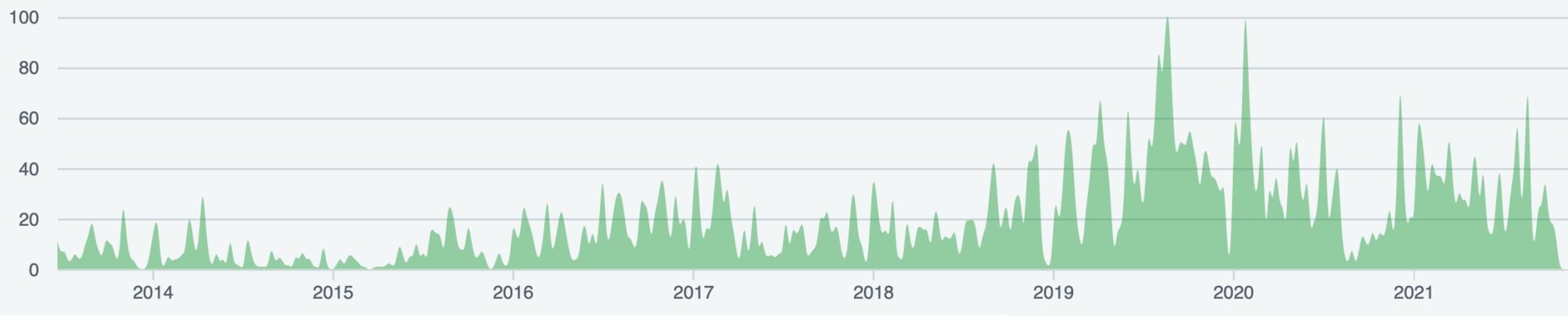


Non-linear Elasticity

Dev Community

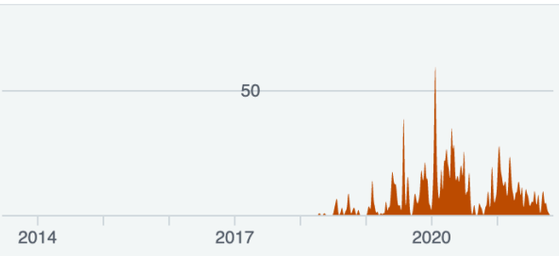
Jun 23, 2013 – Nov 13, 2021

Contributions to master, excluding merge commits and bot accounts



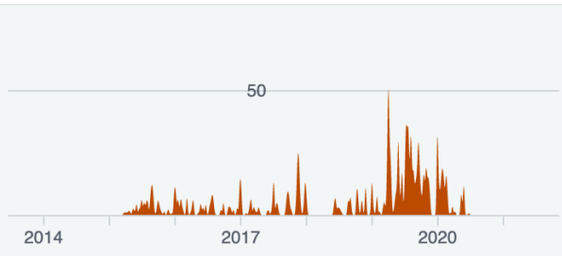
pcarruscag #1

1,517 commits 325,296 ++ 384,007 --



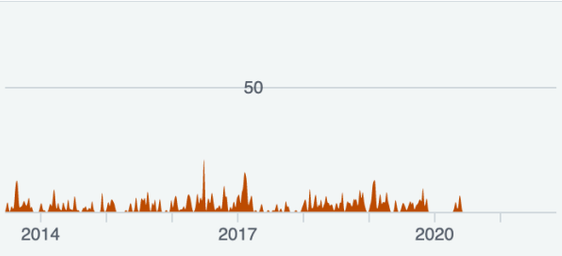
talbring #2

1,458 commits 359,873 ++ 3,376,243 --



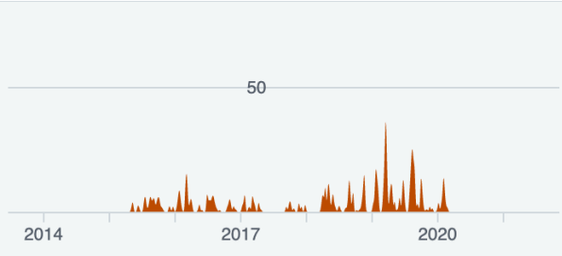
economon #3

991 commits 833,176 ++ 854,000 --



rsanfer #4

838 commits 226,421 ++ 168,839 --



Languages

C++ 90.0% Python 8.3%

C 0.8% Meson 0.3%

Makefile 0.3% M4 0.2%

Other 0.1%

Contributors 83

+ 72 contributors

References

- SU2 GitHub
- SU2 Documentation
- V & V repository
- T. D. Economon, F. Palacios, S. R. Copeland, T. W. Lukaczyk, and J. J. Alonso, “SU2: An Open-Source Suite for Multiphysics Simulation and Design,” *AIAA Journal*, vol. 54, no. 3, pp. 828–846, Mar. 2016, doi: 10.2514/1.J053813.