

Collab: lang., alg., and solvers for nonlocal operators

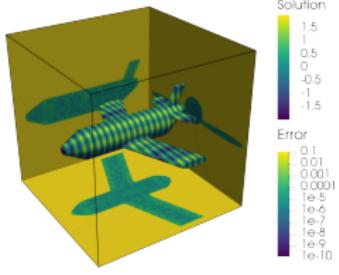
PIs: Kloeckner, Kirby, SHF-1911019/1909176

Nonlocal Operators

- ▶ Layer potentials
- ▶ Volume potentials
- ▶ Fractional derivatives

$$u(\mathbf{x}) = \int_{\Omega} K(\mathbf{x}, \mathbf{y}) \sigma(\mathbf{y}) d\mathbf{y},$$

complex (unstr.) geometry Ω



Proposed Advances:

- ▶ NUFL: Extend UFL for Nonlocal Operators
- ▶ Demo frac. Laplacian
- ▶ Design solver abstraction (HSS mat. ...)

Summary

- ▶ Local+nonlocal
- ▶ Tools make accessible
- ▶ Fast alg. for scalability