bryne - Prototype reusable solvers for coupled multiphysics PDE models

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FEM, Multiphysics Simulation

Acknowlegments

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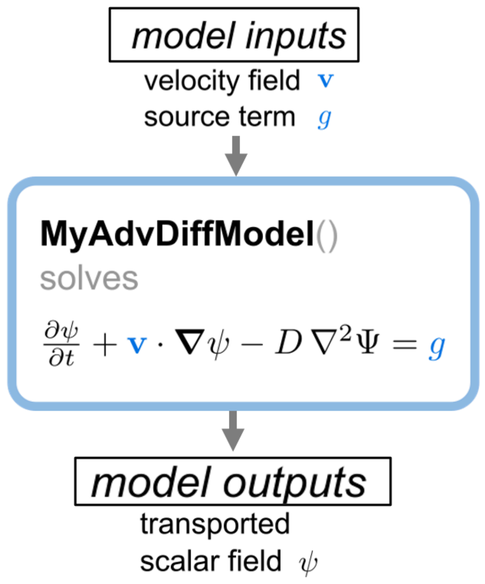
Example



Features

- Modular PDE solver framework
- Reusable model components
- Organized input structure
- Coupled multiphysics support
- Reproducible simulations
- Sustainable prototyping

bryne

[1], [2]

Supported FEM APIs

Dune

Coming soon:

FENICS PROJECT Firedrake

Usage

Python based workflows allow for rapid prototyping of models and numerical methods.

docker

Get started right away with bryne using Docker Containers

Bibliography

[1] B. Terschanski, R. Klöfkorn, A. Dedner, and J. Kowalski, "Bryne: sustainable prototyping of finite element models - Software release ." [Online]. Available: https://doi.org/10.5281/zenodo.15789249

[2] B. Terschanski, R. Klöfkorn, A. Dedner, and J. Kowalski, "Stable across regimes: A mixed DG method for Darcy–Brinkman–Stokes type flows," *Computer Methods in Applied Mechanics and Engineering*, vol. 442, p. 117962, 2025, doi: https://doi.org/10.1016/j.cma.2025.117962.

Overview

Documentation

Available Models

Contact

GitLab