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Integrating PDE Solvers with pyMOR

René Fritze

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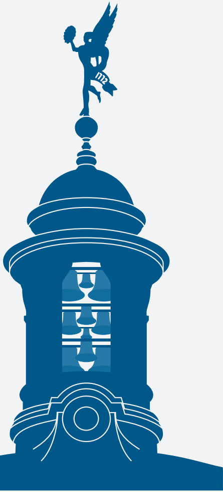

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Available Bindings

- FEniCS
- NGSolve
- deal.II
- Dune XT

Thermalblock Demo

Easily switch the same reduction code from one discretization to another. Here: `FEniCS`+ `pyMOR`

Generic Algorithms via Abstraction

- VectorSpaceInterface
- VectorArrayInterface
- OperatorInterface

Bindings Setup

- Vector Implementation derived from `pymor.vectorarrays.list.CopyOnWriteVector`

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- VectorSpace Implementation derived from `pymor.vectorarrays.list.ListVectorSpace`
- Operator Implementation derived from `pymor.operators.basic.OperatorBase`

Requirements: VectorSpace

- `zero_vector()`
- `make_vector(obj)`

Requirements: Vector

- `copy()`
- `_scal(alpha)`, `_axpy(alpha, x)`, `dot(other)`
- `l1_norm()`, `l2_norm()`, `l2_norm2()`
- `dofs(dof_indices)`
- `amax()`
- `to_numpy(ensure_copy=False)`

Requirements: Operator

- `__init__(self, op)`
- `apply(self, U, mu=None)`

Bindings Types

- Pure Python

  `NGSolve`, `FEniCS`, `pyMOR`

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  deal.II, minimal C++ Demo

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- Python bindings for native (C/C++) data + `pyMOR` Wrappers
  `deal.II`, minimal C++ Demo
- Python wrapper for on-disk serialized data
- Python wrapper for remote discretization server

Minimal C++ Demo

FEniCS Demo