

PS-MMM : Parallel Simulator for (IM-)Miscible Multi-Phase Mixing Flow

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Chapter 1

Namespace Index

1.1 Namespace List

Here is a list of all namespaces with brief descriptions:

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Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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Chapter 4

File Index

4.1 File List

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Chapter 5

Namespace Documentation

5.1 Assembly Namespace Reference

Namespaces

- [CopyData](#)
- [Scratch](#)

5.2 Assembly::CopyData Namespace Reference

Classes

- struct [concentrMatrix](#)
- struct [concentrRHS](#)
- struct [diffusion_step](#)
- struct [pressure_rot_step](#)
- struct [projection_step](#)
- struct [relaxation_div_velocity_step](#)

5.3 Assembly::Scratch Namespace Reference

Classes

- struct [concentrMatrix](#)
- struct [concentrRHS](#)
- struct [diffusion_step](#)
- struct [pressure_rot_step](#)
- struct [projection_step](#)
- struct [relaxation_div_velocity_step](#)

5.4 EquationData Namespace Reference

Classes

- class [concentrInitialValues](#)
- class [concentrInletValues](#)

- class [Inflow_Velocity](#)
- class [Outflow_Pressure](#)

Variables

- const double [pipe_diameter](#) = 19.05
- const double [gravitiy_accelation](#) = 9800
- const double [upstream_concentr](#) = 0.0
- const double [downstream_concentr](#) = 1.0
- const double [kinematic_viscosity](#) = 1.0

5.4.1 Variable Documentation

5.4.1.1 const double EquationData::downstream_concentr = 1.0

5.4.1.2 const double EquationData::gravitiy_accelation = 9800

5.4.1.3 const double EquationData::kinematic_viscosity = 1.0

5.4.1.4 const double EquationData::pipe_diameter = 19.05

5.4.1.5 const double EquationData::upstream_concentr = 0.0

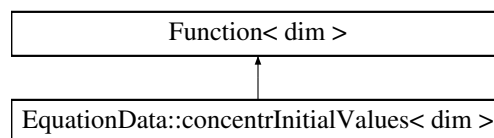
Chapter 6

Class Documentation

6.1 EquationData::concentrInitialValues< dim > Class Template Reference

```
#include <equation_data.h>
```

Inheritance diagram for EquationData::concentrInitialValues< dim >:



Public Member Functions

- [concentrInitialValues](#) (double [x](#))
- virtual double [value](#) (const Point< dim > &p, const unsigned int component=0) const
- virtual void [vector_value](#) (const Point< dim > &p, Vector< double > &[value](#)) const
- virtual void [vector_value_list](#) (const std::vector< Point< dim > > &p, std::vector< Vector< double > > &values) const

Public Attributes

- double [x](#)

6.1.1 Constructor & Destructor Documentation

6.1.1.1 `template<int dim> EquationData::concentrInitialValues< dim >::concentrInitialValues (double x)`

6.1.2 Member Function Documentation

6.1.2.1 `template<int dim> double EquationData::concentrInitialValues< dim >::value (const Point< dim > & p, const unsigned int component = 0) const` [virtual]

6.1.2.2 `template<int dim> void EquationData::concentrInitialValues< dim >::vector_value (const Point< dim > & p, Vector< double > & value) const` [virtual]

6.1.2.3 `template<int dim> void EquationData::concentrInitialValues< dim >::vector_value_list (const std::vector< Point< dim > > & p, std::vector< Vector< double > > & values) const` [virtual]

6.1.3 Member Data Documentation

6.1.3.1 `template<int dim> double EquationData::concentrInitialValues< dim >::x`

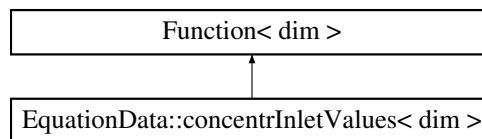
The documentation for this class was generated from the following file:

- [/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/equation_data.h](#)

6.2 EquationData::concentrInletValues< dim > Class Template Reference

```
#include <equation_data.h>
```

Inheritance diagram for EquationData::concentrInletValues< dim >:



Public Member Functions

- [concentrInletValues](#) ()
- virtual double [value](#) (const Point< dim > &p, const unsigned int component=0) const
- virtual void [vector_value](#) (const Point< dim > &p, Vector< double > &value) const

6.2.1 Constructor & Destructor Documentation

6.2.1.1 `template<int dim> EquationData::concentrInletValues< dim >::concentrInletValues () [inline]`

6.2.2 Member Function Documentation

6.2.2.1 `template<int dim> double EquationData::concentrInletValues< dim >::value (const Point< dim > &p, const unsigned int component = 0) const [virtual]`

6.2.2.2 `template<int dim> void EquationData::concentrInletValues< dim >::vector_value (const Point< dim > &p, Vector< double > &value) const [virtual]`

The documentation for this class was generated from the following file:

- [/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/equation_data.h](#)

6.3 Assembly::Scratch::concentrMatrix< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [concentrMatrix](#) (const FiniteElement< dim > &concentr_fe, const Mapping< dim > &mapping, const Quadrature< dim > &concentr_quadrature)
- [concentrMatrix](#) (const [concentrMatrix](#) &data)

Public Attributes

- FEValues< dim > [concentr_fe_values](#)
- std::vector< double > [phi_T](#)
- std::vector< Tensor< 1, dim > > [grad_phi_T](#)

6.3.1 Constructor & Destructor Documentation

6.3.1.1 `template<int dim> Assembly::Scratch::concentrMatrix< dim >::concentrMatrix (const FiniteElement< dim > & concentr_fe, const Mapping< dim > & mapping, const Quadrature< dim > & concentr_quadrature)`

6.3.1.2 `template<int dim> Assembly::Scratch::concentrMatrix< dim >::concentrMatrix (const concentrMatrix< dim > & data)`

6.3.2 Member Data Documentation

6.3.2.1 `template<int dim> FEValues<dim> Assembly::Scratch::concentrMatrix< dim >::concentr_fe_values`

6.3.2.2 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::concentrMatrix< dim >::grad_phi_T`

6.3.2.3 `template<int dim> std::vector<double> Assembly::Scratch::concentrMatrix< dim >::phi_T`

The documentation for this struct was generated from the following file:

- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/assembly_copydata.h](#)

6.4 Assembly::CopyData::concentrMatrix< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [concentrMatrix](#) (const FiniteElement< dim > &concentr_fe)
- [concentrMatrix](#) (const [concentrMatrix](#) &data)

Public Attributes

- FullMatrix< double > [local_mass_matrix](#)
- FullMatrix< double > [local_stiffness_matrix](#)
- std::vector< types::global_dof_index > [local_dof_indices](#)

6.4.1 Constructor & Destructor Documentation

6.4.1.1 `template<int dim> Assembly::CopyData::concentrMatrix< dim >::concentrMatrix (const FiniteElement< dim > & concentr_fe)`

6.4.1.2 `template<int dim> Assembly::CopyData::concentrMatrix< dim >::concentrMatrix (const concentrMatrix< dim > & data)`

6.4.2 Member Data Documentation

6.4.2.1 `template<int dim> std::vector<types::global_dof_index> Assembly::CopyData::concentrMatrix< dim >::local_dof_indices`

6.4.2.2 `template<int dim> FullMatrix<double> Assembly::CopyData::concentrMatrix< dim >::local_mass_matrix`

6.4.2.3 `template<int dim> FullMatrix<double> Assembly::CopyData::concentrMatrix< dim >::local_stiffness_matrix`

The documentation for this struct was generated from the following file:

- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/assembly_copydata.h](#)

6.5 Assembly::Scratch::concentrRHS< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [concentrRHS](#) (const FiniteElement< dim > &concentr_fe, const FiniteElement< dim > &fe_velocity, const Mapping< dim > &mapping, const Quadrature< dim > &quadrature)
- [concentrRHS](#) (const [concentrRHS](#) &data)

Public Attributes

- FEValues< dim > [concentr_fe_values](#)
- FEValues< dim > [fe_velocity_values](#)
- std::vector< double > [phi_T](#)
- std::vector< Tensor< 1, dim > > [grad_phi_T](#)
- std::vector< Tensor< 1, dim > > [old_velocity_values](#)
- std::vector< Tensor< 1, dim > > [old_old_velocity_values](#)
- std::vector< SymmetricTensor< 2, dim > > [old_strain_rates](#)
- std::vector< SymmetricTensor< 2, dim > > [old_old_strain_rates](#)
- std::vector< double > [old_concentr_values](#)
- std::vector< double > [old_old_concentr_values](#)
- std::vector< Tensor< 1, dim > > [old_concentr_grads](#)
- std::vector< Tensor< 1, dim > > [old_old_concentr_grads](#)
- std::vector< double > [old_concentr_laplacians](#)
- std::vector< double > [old_old_concentr_laplacians](#)

6.5.1 Constructor & Destructor Documentation

6.5.1.1 `template<int dim> Assembly::Scratch::concentrRHS< dim >::concentrRHS (const FiniteElement< dim > & concentr_fe, const FiniteElement< dim > & fe_velocity, const Mapping< dim > & mapping, const Quadrature< dim > & quadrature)`

6.5.1.2 `template<int dim> Assembly::Scratch::concentrRHS< dim >::concentrRHS (const concentrRHS< dim > & data)`

6.5.2 Member Data Documentation

6.5.2.1 `template<int dim> FEValues<dim> Assembly::Scratch::concentrRHS< dim >::concentr_fe_values`

6.5.2.2 `template<int dim> FEValues<dim> Assembly::Scratch::concentrRHS< dim >::fe_velocity_values`

- 6.5.2.3 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::concentrRHS< dim >::grad_phi_T`
- 6.5.2.4 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::concentrRHS< dim >::old_concentr_grads`
- 6.5.2.5 `template<int dim> std::vector<double> Assembly::Scratch::concentrRHS< dim >::old_concentr_laplacians`
- 6.5.2.6 `template<int dim> std::vector<double> Assembly::Scratch::concentrRHS< dim >::old_concentr_values`
- 6.5.2.7 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::concentrRHS< dim >::old_old_concentr_grads`
- 6.5.2.8 `template<int dim> std::vector<double> Assembly::Scratch::concentrRHS< dim >::old_old_concentr_laplacians`
- 6.5.2.9 `template<int dim> std::vector<double> Assembly::Scratch::concentrRHS< dim >::old_old_concentr_values`
- 6.5.2.10 `template<int dim> std::vector<SymmetricTensor<2,dim> > Assembly::Scratch::concentrRHS< dim >::old_old_strain_rates`
- 6.5.2.11 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::concentrRHS< dim >::old_old_velocity_values`
- 6.5.2.12 `template<int dim> std::vector<SymmetricTensor<2,dim> > Assembly::Scratch::concentrRHS< dim >::old_strain_rates`
- 6.5.2.13 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::concentrRHS< dim >::old_velocity_values`
- 6.5.2.14 `template<int dim> std::vector<double> Assembly::Scratch::concentrRHS< dim >::phi_T`

The documentation for this struct was generated from the following file:

- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/assembly_copydata.h](#)

6.6 Assembly::CopyData::concentrRHS< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [concentrRHS](#) (const FiniteElement< dim > &concentr_fe)
- [concentrRHS](#) (const [concentrRHS](#) &data)

Public Attributes

- Vector< double > [local_rhs](#)
- std::vector< types::global_dof_index > [local_dof_indices](#)
- FullMatrix< double > [matrix_for_bc](#)

6.6.1 Constructor & Destructor Documentation

6.6.1.1 `template<int dim> Assembly::CopyData::concentrRHS< dim >::concentrRHS (const FiniteElement< dim > & concentr_fe)`

6.6.1.2 `template<int dim> Assembly::CopyData::concentrRHS< dim >::concentrRHS (const concentrRHS< dim > & data)`

6.6.2 Member Data Documentation

6.6.2.1 `template<int dim> std::vector<types::global_dof_index> Assembly::CopyData::concentrRHS< dim >::local_dof_indices`

6.6.2.2 `template<int dim> Vector<double> Assembly::CopyData::concentrRHS< dim >::local_rhs`

6.6.2.3 `template<int dim> FullMatrix<double> Assembly::CopyData::concentrRHS< dim >::matrix_for_bc`

The documentation for this struct was generated from the following file:

- /Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/[assembly_copydata.h](#)

6.7 Assembly::Scratch::diffusion_step< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [diffusion_step](#) (const FiniteElement< dim > &fe_velocity, const Mapping< dim > &velocity_mapping, const Quadrature< dim > &quadrature, const UpdateFlags velocity_update_flags, const FiniteElement< dim > &fe_pressure, const Mapping< dim > &pressure_mapping, const UpdateFlags pressure_update_flags, const FiniteElement< dim > &concentr_fe, const Mapping< dim > &concentr_mapping, const UpdateFlags concentr_update_flags)
- [diffusion_step](#) (const [diffusion_step](#) &data)

Public Attributes

- FEValues< dim > [fe_velocity_values](#)
- FEValues< dim > [fe_pressure_values](#)
- FEValues< dim > [concentr_fe_values](#)
- std::vector< Tensor< 2, dim > > [grads_phi_u](#)
- std::vector< SymmetricTensor< 2, dim > > [symm_grads_phi_u](#)
- std::vector< Tensor< 1, dim > > [phi_u](#)
- std::vector< Tensor< 1, dim > > [divergence_phi_u](#)
- std::vector< Tensor< 1, dim > > [vel_star_values](#)
- std::vector< Tensor< 1, dim > > [vel_n_values](#)
- std::vector< Tensor< 1, dim > > [vel_n_minus_1_values](#)
- std::vector< Tensor< 2, dim > > [grad_vel_star_values](#)
- std::vector< Tensor< 1, dim > > [laplacian_vel_star_values](#)
- std::vector< Tensor< 1, dim > > [grad_aux_n_values](#)
- std::vector< Tensor< 1, dim > > [grad_aux_n_minus_1_values](#)
- std::vector< Tensor< 1, dim > > [grad_pre_n_values](#)
- std::vector< Tensor< 2, dim > > [grad_grad_aux_n_values](#)
- std::vector< Tensor< 2, dim > > [grad_grad_aux_n_minus_1_values](#)
- std::vector< Tensor< 2, dim > > [grad_grad_pre_n_values](#)
- std::vector< double > [aux_n_values](#)

- std::vector< double > [aux_n_minus_1_values](#)
- std::vector< double > [pre_n_values](#)
- std::vector< double > [concentr_values](#)
- std::vector< SymmetricTensor< 2, dim > > [symm_grads_vel_star](#)

6.7.1 Constructor & Destructor Documentation

6.7.1.1 `template<int dim> Assembly::Scratch::diffusion_step< dim >::diffusion_step (const FiniteElement< dim > & fe_velocity, const Mapping< dim > & velocity_mapping, const Quadrature< dim > & quadrature, const UpdateFlags velocity_update_flags, const FiniteElement< dim > & fe_pressure, const Mapping< dim > & pressure_mapping, const UpdateFlags pressure_update_flags, const FiniteElement< dim > & concentr_fe, const Mapping< dim > & concentr_mapping, const UpdateFlags concentr_update_flags)`

6.7.1.2 `template<int dim> Assembly::Scratch::diffusion_step< dim >::diffusion_step (const diffusion_step< dim > & data)`

6.7.2 Member Data Documentation

6.7.2.1 `template<int dim> std::vector<double> Assembly::Scratch::diffusion_step< dim >::aux_n_minus_1_values`

6.7.2.2 `template<int dim> std::vector<double> Assembly::Scratch::diffusion_step< dim >::aux_n_values`

6.7.2.3 `template<int dim> FEValues<dim> Assembly::Scratch::diffusion_step< dim >::concentr_fe_values`

6.7.2.4 `template<int dim> std::vector<double> Assembly::Scratch::diffusion_step< dim >::concentr_values`

6.7.2.5 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::diffusion_step< dim >::divergence_phi_u`

6.7.2.6 `template<int dim> FEValues<dim> Assembly::Scratch::diffusion_step< dim >::fe_pressure_values`

6.7.2.7 `template<int dim> FEValues<dim> Assembly::Scratch::diffusion_step< dim >::fe_velocity_values`

6.7.2.8 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::diffusion_step< dim >::grad_aux_n_minus_1_values`

6.7.2.9 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::diffusion_step< dim >::grad_aux_n_values`

6.7.2.10 `template<int dim> std::vector<Tensor<2,dim> > Assembly::Scratch::diffusion_step< dim >::grad_grad_aux_n_minus_1_values`

6.7.2.11 `template<int dim> std::vector<Tensor<2,dim> > Assembly::Scratch::diffusion_step< dim >::grad_grad_aux_n_values`

6.7.2.12 `template<int dim> std::vector<Tensor<2,dim> > Assembly::Scratch::diffusion_step< dim >::grad_grad_pre_n_values`

6.7.2.13 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::diffusion_step< dim >::grad_pre_n_values`

6.7.2.14 `template<int dim> std::vector<Tensor<2,dim> > Assembly::Scratch::diffusion_step< dim >::grad_vel_star_values`

- 6.7.2.15 `template<int dim> std::vector<Tensor<2,dim> > Assembly::Scratch::diffusion_step< dim >::grads_phi_u`
- 6.7.2.16 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::diffusion_step< dim >::laplacian_vel_star_values`
- 6.7.2.17 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::diffusion_step< dim >::phi_u`
- 6.7.2.18 `template<int dim> std::vector<double> Assembly::Scratch::diffusion_step< dim >::pre_n_values`
- 6.7.2.19 `template<int dim> std::vector<SymmetricTensor<2,dim> > Assembly::Scratch::diffusion_step< dim >::symm_grads_phi_u`
- 6.7.2.20 `template<int dim> std::vector<SymmetricTensor<2,dim> > Assembly::Scratch::diffusion_step< dim >::symm_grads_vel_star`
- 6.7.2.21 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::diffusion_step< dim >::vel_n_minus_1_values`
- 6.7.2.22 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::diffusion_step< dim >::vel_n_values`
- 6.7.2.23 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::diffusion_step< dim >::vel_star_values`

The documentation for this struct was generated from the following file:

- [/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/assembly_copydata.h](#)

6.8 Assembly::CopyData::diffusion_step< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [diffusion_step](#) (const FiniteElement< dim > &fe_velocity)
- [diffusion_step](#) (const [diffusion_step](#) &data)

Public Attributes

- FullMatrix< double > [local_matrix](#)
- Vector< double > [local_rhs](#)
- std::vector< types::global_dof_index > [local_dof_indices](#)

6.8.1 Constructor & Destructor Documentation

- 6.8.1.1 `template<int dim> Assembly::CopyData::diffusion_step< dim >::diffusion_step (const FiniteElement< dim > & fe_velocity)`
- 6.8.1.2 `template<int dim> Assembly::CopyData::diffusion_step< dim >::diffusion_step (const diffusion_step< dim > & data)`

6.8.2 Member Data Documentation

6.8.2.1 `template<int dim> std::vector<types::global_dof_index> Assembly::CopyData::diffusion_step< dim >::local_dof_indices`

6.8.2.2 `template<int dim> FullMatrix<double> Assembly::CopyData::diffusion_step< dim >::local_matrix`

6.8.2.3 `template<int dim> Vector<double> Assembly::CopyData::diffusion_step< dim >::local_rhs`

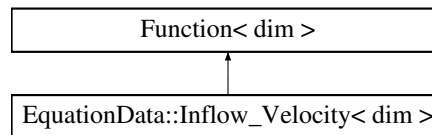
The documentation for this struct was generated from the following file:

- `/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/assembly_copydata.h`

6.9 EquationData::Inflow_Velocity< dim > Class Template Reference

```
#include <equation_data.h>
```

Inheritance diagram for EquationData::Inflow_Velocity< dim >:



Public Member Functions

- `Inflow_Velocity` (double, unsigned int)
- virtual double `value` (const Point< dim > &p, const unsigned int component=0) const
- virtual void `vector_value` (const Point< dim > &p, Vector< double > &value) const
- virtual void `vector_value_list` (const std::vector< Point< dim > > &p, std::vector< Vector< double > > &values) const

Public Attributes

- double `init_mean_vel`
- unsigned int `which_inflow_type`

6.9.1 Constructor & Destructor Documentation

6.9.1.1 `template<int dim> EquationData::Inflow_Velocity< dim >::Inflow_Velocity (double init_mean_vel, unsigned int which_inflow_type)`

6.9.2 Member Function Documentation

6.9.2.1 `template<int dim> double EquationData::Inflow_Velocity< dim >::value (const Point< dim > &p, const unsigned int component = 0) const` [virtual]

6.9.2.2 `template<int dim> void EquationData::Inflow_Velocity< dim >::vector_value (const Point< dim > &p, Vector< double > &value) const` [virtual]

6.9.2.3 `template<int dim> void EquationData::Inflow_Velocity< dim >::vector_value_list (const std::vector< Point< dim > > & p, std::vector< Vector< double > > & values) const` [virtual]

6.9.3 Member Data Documentation

6.9.3.1 `template<int dim> double EquationData::Inflow_Velocity< dim >::init_mean_vel`

6.9.3.2 `template<int dim> unsigned int EquationData::Inflow_Velocity< dim >::which_inflow_type`

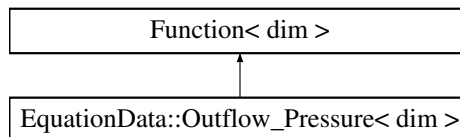
The documentation for this class was generated from the following file:

- [/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/equation_data.h](#)

6.10 EquationData::Outflow_Pressure< dim > Class Template Reference

```
#include <equation_data.h>
```

Inheritance diagram for EquationData::Outflow_Pressure< dim >:



Public Member Functions

- [Outflow_Pressure](#) (double, double)
- virtual double [value](#) (const Point< dim > &p, const unsigned int component=0) const
- virtual void [vector_value](#) (const Point< dim > &p, Vector< double > &value) const
- virtual void [vector_value_list](#) (const std::vector< Point< dim > > &p, std::vector< Vector< double > > &values) const

Public Attributes

- double [inclined_angle](#)
- double [Froude_number](#)

6.10.1 Constructor & Destructor Documentation

6.10.1.1 `template<int dim> EquationData::Outflow_Pressure< dim >::Outflow_Pressure (double inclined_angle, double Froude_number)`

6.10.2 Member Function Documentation

6.10.2.1 `template<int dim> double EquationData::Outflow_Pressure< dim >::value (const Point< dim > & p, const unsigned int component = 0) const` [virtual]

6.10.2.2 `template<int dim> void EquationData::Outflow_Pressure< dim >::vector_value (const Point< dim > & p, Vector< double > & value) const` [virtual]

6.10.2.3 `template<int dim> void EquationData::Outflow_Pressure< dim >::vector_value_list (const std::vector< Point< dim > > & p, std::vector< Vector< double > > & values) const [virtual]`

6.10.3 Member Data Documentation

6.10.3.1 `template<int dim> double EquationData::Outflow_Pressure< dim >::Froude_number`

6.10.3.2 `template<int dim> double EquationData::Outflow_Pressure< dim >::inclined_angle`

The documentation for this class was generated from the following file:

- `/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/equation_data.h`

6.11 UBC_mis_mixing< dim >::Parameters Struct Reference

```
#include <class.h>
```

Public Member Functions

- `Parameters` (std::string ¶meters_filename)
- void `parse_parameters` (ParameterHandler &prm)

Static Public Member Functions

- static void `declare_parameters` (ParameterHandler &prm)

Public Attributes

- std::string `input_mesh_file`
- Point< dim > `length_of_domain`
- std::vector< double > `domain_size`
- std::vector< double > `domain_boundary`
- unsigned int `num_element_size`
- unsigned int `flow_direction`
- unsigned int `depth_direction`
- unsigned int `latitude_direction`
- unsigned int `num_slices_domain`
- bool `is_symmetry_boundary`
- unsigned int `max_grid_level`
- unsigned int `type_adaptivity_rule`
- double `error_threshold`
- double `ref_crit`
- double `coar_crit`
- unsigned int `no_refine_period`
- unsigned int `intial_ratio_refinement`
- double `stabilization_alpha`
- double `stabilization_beta`
- double `stabilization_c_R`
- unsigned int `ist_optimization_method`
- unsigned int `ist_projection_method`
- unsigned int `ist_pressure_boundary`
- unsigned int `ist_flow_source`

- bool [ist_uniform_flow](#)
- double [coeff_relax_div_velocity](#)
- unsigned int [no_steps_for_buffering](#)
- double [mesh_speed](#)
- unsigned int [dir_concentration](#)
- unsigned int [which_method_for_c](#)
- unsigned int [which_interpl_c](#)
- bool [ist_add_reinit](#)
- double [coeff_gamma_grad_div](#)
- double [coeff_arti_viscosity](#)
- double [maximum_coeff_arti_viscosity](#)
- bool [exclude_depth_direction](#)
- bool [is_verbal_output](#)
- double [CFL_number](#)
- double [init_sep_x](#)
- double [inclined_angle](#)
- double [Atwood_number](#)
- double [mean_velocity_inlet](#)
- double [inlet_pressure](#)
- double [viscosity_ratio](#)
- double [computed_time_step](#)
- double [Reynolds_number](#)
- double [Froude_number](#)
- double [reference_length](#)
- double [reference_time](#)
- double [reference_velocity](#)
- bool [is_density_stable_flow](#)
- double [upstream_concentr](#)
- double [downstream_concentr](#)
- double [mean_viscosity](#)
- double [ratio_pow_law](#)
- double [n_pow_law](#)
- Point< dim > [inclined_angle_vector](#)
- double [tau_step](#)
- double [eps_v_concentr](#)
- unsigned int [degree_of_velocity](#)
- unsigned int [degree_of_pressure](#)
- unsigned int [degree_of_concentr](#)
- unsigned int [data_id](#)
- unsigned int [output_fac_vtu](#)
- unsigned int [output_fac_data](#)
- unsigned int [number_slices_coarse_mesh](#)
- bool [is_restart](#)
- unsigned int [save_fac_period](#)
- unsigned int [index_for_restart](#)
- unsigned int [restart_no_timestep](#)
- double [check_total_time](#)
- double [check_total_real_time](#)
- double [check_current_time_step](#)
- double [check_old_time_step](#)
- double [eps_ns](#)
- double [eps_c](#)
- unsigned int [kry_size](#)
- unsigned int [no_test_case](#)

6.11.1 Constructor & Destructor Documentation

6.11.1.1 `template<int dim> UBC_mis_mixing< dim >::Parameters::Parameters (std::string & parameters_filename)`

6.11.2 Member Function Documentation

6.11.2.1 `template<int dim> void UBC_mis_mixing< dim >::Parameters::declare_parameters (ParameterHandler & prm)`
`[static]`

6.11.2.2 `template<int dim> void UBC_mis_mixing< dim >::Parameters::parse_parameters (ParameterHandler & prm)`

6.11.3 Member Data Documentation

6.11.3.1 `template<int dim> double UBC_mis_mixing< dim >::Parameters::Atwood_number`

6.11.3.2 `template<int dim> double UBC_mis_mixing< dim >::Parameters::CFL_number`

6.11.3.3 `template<int dim> double UBC_mis_mixing< dim >::Parameters::check_current_time_step`

6.11.3.4 `template<int dim> double UBC_mis_mixing< dim >::Parameters::check_old_time_step`

6.11.3.5 `template<int dim> double UBC_mis_mixing< dim >::Parameters::check_total_real_time`

6.11.3.6 `template<int dim> double UBC_mis_mixing< dim >::Parameters::check_total_time`

6.11.3.7 `template<int dim> double UBC_mis_mixing< dim >::Parameters::coar_crit`

6.11.3.8 `template<int dim> double UBC_mis_mixing< dim >::Parameters::coeff_arti_viscosity`

6.11.3.9 `template<int dim> double UBC_mis_mixing< dim >::Parameters::coeff_gamma_grad_div`

6.11.3.10 `template<int dim> double UBC_mis_mixing< dim >::Parameters::coeff_relax_div_velocity`

6.11.3.11 `template<int dim> double UBC_mis_mixing< dim >::Parameters::computed_time_step`

6.11.3.12 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::data_id`

6.11.3.13 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::degree_of_concentr`

6.11.3.14 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::degree_of_pressure`

6.11.3.15 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::degree_of_velocity`

6.11.3.16 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::depth_direction`

6.11.3.17 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::dir_concentration`

6.11.3.18 `template<int dim> std::vector<double> UBC_mis_mixing< dim >::Parameters::domain_boundary`

6.11.3.19 `template<int dim> std::vector<double> UBC_mis_mixing< dim >::Parameters::domain_size`

6.11.3.20 `template<int dim> double UBC_mis_mixing< dim >::Parameters::downstream_concentr`

6.11.3.21 `template<int dim> double UBC_mis_mixing< dim >::Parameters::eps_c`

- 6.11.3.22 `template<int dim> double UBC_mis_mixing< dim >::Parameters::eps_ns`
- 6.11.3.23 `template<int dim> double UBC_mis_mixing< dim >::Parameters::eps_v_concentr`
- 6.11.3.24 `template<int dim> double UBC_mis_mixing< dim >::Parameters::error_threshold`
- 6.11.3.25 `template<int dim> bool UBC_mis_mixing< dim >::Parameters::exclude_depth_direction`
- 6.11.3.26 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::flow_direction`
- 6.11.3.27 `template<int dim> double UBC_mis_mixing< dim >::Parameters::Froude_number`
- 6.11.3.28 `template<int dim> double UBC_mis_mixing< dim >::Parameters::inclined_angle`
- 6.11.3.29 `template<int dim> Point<dim> UBC_mis_mixing< dim >::Parameters::inclined_angle_vector`
- 6.11.3.30 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::index_for_restart`
- 6.11.3.31 `template<int dim> double UBC_mis_mixing< dim >::Parameters::init_sep_x`
- 6.11.3.32 `template<int dim> double UBC_mis_mixing< dim >::Parameters::inlet_pressure`
- 6.11.3.33 `template<int dim> std::string UBC_mis_mixing< dim >::Parameters::input_mesh_file`
- 6.11.3.34 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::intial_ratio_refinement`
- 6.11.3.35 `template<int dim> bool UBC_mis_mixing< dim >::Parameters::is_density_stable_flow`
- 6.11.3.36 `template<int dim> bool UBC_mis_mixing< dim >::Parameters::is_restart`
- 6.11.3.37 `template<int dim> bool UBC_mis_mixing< dim >::Parameters::is_symmetry_boundary`
- 6.11.3.38 `template<int dim> bool UBC_mis_mixing< dim >::Parameters::is_verbal_output`
- 6.11.3.39 `template<int dim> bool UBC_mis_mixing< dim >::Parameters::ist_add_reinit`
- 6.11.3.40 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::ist_flow_source`
- 6.11.3.41 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::ist_optimization_method`
- 6.11.3.42 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::ist_pressure_boundary`
- 6.11.3.43 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::ist_projection_method`
- 6.11.3.44 `template<int dim> bool UBC_mis_mixing< dim >::Parameters::ist_uniform_flow`
- 6.11.3.45 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::kry_size`
- 6.11.3.46 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::latitude_direction`
- 6.11.3.47 `template<int dim> Point<dim> UBC_mis_mixing< dim >::Parameters::length_of_domain`
- 6.11.3.48 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::max_grid_level`
- 6.11.3.49 `template<int dim> double UBC_mis_mixing< dim >::Parameters::maximum_coeff_arti_viscosity`

- 6.11.3.50 `template<int dim> double UBC_mis_mixing< dim >::Parameters::mean_velocity_inlet`
- 6.11.3.51 `template<int dim> double UBC_mis_mixing< dim >::Parameters::mean_viscosity`
- 6.11.3.52 `template<int dim> double UBC_mis_mixing< dim >::Parameters::mesh_speed`
- 6.11.3.53 `template<int dim> double UBC_mis_mixing< dim >::Parameters::n_pow_law`
- 6.11.3.54 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::no_refine_period`
- 6.11.3.55 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::no_steps_for_buffering`
- 6.11.3.56 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::no_test_case`
- 6.11.3.57 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::num_element_size`
- 6.11.3.58 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::num_slices_domain`
- 6.11.3.59 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::number_slices_coarse_mesh`
- 6.11.3.60 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::output_fac_data`
- 6.11.3.61 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::output_fac_vtu`
- 6.11.3.62 `template<int dim> double UBC_mis_mixing< dim >::Parameters::ratio_pow_law`
- 6.11.3.63 `template<int dim> double UBC_mis_mixing< dim >::Parameters::ref_crit`
- 6.11.3.64 `template<int dim> double UBC_mis_mixing< dim >::Parameters::reference_length`
- 6.11.3.65 `template<int dim> double UBC_mis_mixing< dim >::Parameters::reference_time`
- 6.11.3.66 `template<int dim> double UBC_mis_mixing< dim >::Parameters::reference_velocity`
- 6.11.3.67 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::restart_no_timestep`
- 6.11.3.68 `template<int dim> double UBC_mis_mixing< dim >::Parameters::Reynolds_number`
- 6.11.3.69 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::save_fac_period`
- 6.11.3.70 `template<int dim> double UBC_mis_mixing< dim >::Parameters::stabilization_alpha`
- 6.11.3.71 `template<int dim> double UBC_mis_mixing< dim >::Parameters::stabilization_beta`
- 6.11.3.72 `template<int dim> double UBC_mis_mixing< dim >::Parameters::stabilization_c_R`
- 6.11.3.73 `template<int dim> double UBC_mis_mixing< dim >::Parameters::tau_step`
- 6.11.3.74 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::type_adaptivity_rule`
- 6.11.3.75 `template<int dim> double UBC_mis_mixing< dim >::Parameters::upstream_concentr`
- 6.11.3.76 `template<int dim> double UBC_mis_mixing< dim >::Parameters::viscosity_ratio`
- 6.11.3.77 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::which_interpl_c`

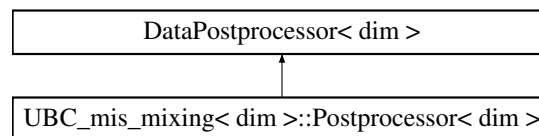
6.11.3.78 `template<int dim> unsigned int UBC_mis_mixing< dim >::Parameters::which_method_for_c`

The documentation for this struct was generated from the following files:

- [/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/class.h](#)
- [/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/parameter.h](#)

6.12 UBC_mis_mixing< dim >::Postprocessor< dim > Class Template Reference

Inheritance diagram for UBC_mis_mixing< dim >::Postprocessor< dim >:



Public Member Functions

- [Postprocessor](#) (const unsigned int partition)
- virtual void [compute_derived_quantities_vector](#) (const std::vector< Vector< double > > &uh, const std::vector< std::vector< Tensor< 1, dim > > > &duh, const std::vector< std::vector< Tensor< 2, dim > > > &dduh, const std::vector< Point< dim > > &normals, const std::vector< Point< dim > > &evaluation_points, std::vector< Vector< double > > &computed_quantities) const
- virtual std::vector< std::string > [get_names](#) () const
- virtual std::vector< DataComponentInterpretation::DataComponentInterpretation > [get_data_component_interpretation](#) () const
- virtual UpdateFlags [get_needed_update_flags](#) () const

6.12.1 Constructor & Destructor Documentation

- 6.12.1.1 `template<int dim> template<int dim> UBC_mis_mixing< dim >::Postprocessor< dim >::Postprocessor (const unsigned int partition)`

6.12.2 Member Function Documentation

- 6.12.2.1 `template<int dim> template<int dim> void UBC_mis_mixing< dim >::Postprocessor< dim >::compute_derived_quantities_vector (const std::vector< Vector< double > > &uh, const std::vector< std::vector< Tensor< 1, dim > > > &duh, const std::vector< std::vector< Tensor< 2, dim > > > &dduh, const std::vector< Point< dim > > &normals, const std::vector< Point< dim > > &evaluation_points, std::vector< Vector< double > > &computed_quantities) const [virtual]`
- 6.12.2.2 `template<int dim> template<int dim> std::vector< DataComponentInterpretation::DataComponentInterpretation > UBC_mis_mixing< dim >::Postprocessor< dim >::get_data_component_interpretation () const [virtual]`
- 6.12.2.3 `template<int dim> template<int dim> std::vector< std::string > UBC_mis_mixing< dim >::Postprocessor< dim >::get_names () const [virtual]`
- 6.12.2.4 `template<int dim> template<int dim> UpdateFlags UBC_mis_mixing< dim >::Postprocessor< dim >::get_needed_update_flags () const [virtual]`

The documentation for this class was generated from the following file:

- [/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/Post_Processing/post_processing.](#)↵
cc

6.13 Assembly::CopyData::pressure_rot_step< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [pressure_rot_step](#) (const FiniteElement< dim > &fe_pressure)
- [pressure_rot_step](#) (const [pressure_rot_step](#) &data)

Public Attributes

- FullMatrix< double > [local_matrix](#)
- Vector< double > [local_rhs](#)
- std::vector< types::global_dof_index > [local_dof_indices](#)

6.13.1 Constructor & Destructor Documentation

6.13.1.1 `template<int dim> Assembly::CopyData::pressure_rot_step< dim >::pressure_rot_step (const FiniteElement< dim > & fe_pressure)`

6.13.1.2 `template<int dim> Assembly::CopyData::pressure_rot_step< dim >::pressure_rot_step (const pressure_rot_step< dim > & data)`

6.13.2 Member Data Documentation

6.13.2.1 `template<int dim> std::vector<types::global_dof_index> Assembly::CopyData::pressure_rot_step< dim >::local_dof_indices`

6.13.2.2 `template<int dim> FullMatrix<double> Assembly::CopyData::pressure_rot_step< dim >::local_matrix`

6.13.2.3 `template<int dim> Vector<double> Assembly::CopyData::pressure_rot_step< dim >::local_rhs`

The documentation for this struct was generated from the following file:

- [/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/assembly_copydata.h](#)

6.14 Assembly::Scratch::pressure_rot_step< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [pressure_rot_step](#) (const FiniteElement< dim > &fe_pressure, const Mapping< dim > &pressure_mapping, const Quadrature< dim > &quadrature, const UpdateFlags pressure_update_flags, const FiniteElement< dim > &fe_velocity, const Mapping< dim > &velocity_mapping, const UpdateFlags velocity_update_flags, const FiniteElement< dim > &concentr_fe, const Mapping< dim > &concentr_mapping, const UpdateFlags concentr_update_flags)
- [pressure_rot_step](#) (const [pressure_rot_step](#) &data)

Public Attributes

- FEValues< dim > [fe_pressure_values](#)
- FEValues< dim > [fe_velocity_values](#)
- FEValues< dim > [concentr_fe_values](#)
- std::vector< double > [phi_p](#)
- std::vector< double > [aux_sol_values](#)
- std::vector< double > [pre_sol_values](#)
- std::vector< Tensor< 2, dim > > [grad_vel_sol_values](#)
- std::vector< double > [concentr_values](#)
- std::vector< SymmetricTensor< 2, dim > > [symm_grads_vel_sol](#)

6.14.1 Constructor & Destructor Documentation

- 6.14.1.1 `template<int dim> Assembly::Scratch::pressure_rot_step< dim >::pressure_rot_step (const FiniteElement< dim > & fe_pressure, const Mapping< dim > & pressure_mapping, const Quadrature< dim > & quadrature, const UpdateFlags pressure_update_flags, const FiniteElement< dim > & fe_velocity, const Mapping< dim > & velocity_mapping, const UpdateFlags velocity_update_flags, const FiniteElement< dim > & concentr_fe, const Mapping< dim > & concentr_mapping, const UpdateFlags concentr_update_flags)`
- 6.14.1.2 `template<int dim> Assembly::Scratch::pressure_rot_step< dim >::pressure_rot_step (const pressure_rot_step< dim > & data)`

6.14.2 Member Data Documentation

- 6.14.2.1 `template<int dim> std::vector<double> Assembly::Scratch::pressure_rot_step< dim >::aux_sol_values`
- 6.14.2.2 `template<int dim> FEValues<dim> Assembly::Scratch::pressure_rot_step< dim >::concentr_fe_values`
- 6.14.2.3 `template<int dim> std::vector<double> Assembly::Scratch::pressure_rot_step< dim >::concentr_values`
- 6.14.2.4 `template<int dim> FEValues<dim> Assembly::Scratch::pressure_rot_step< dim >::fe_pressure_values`
- 6.14.2.5 `template<int dim> FEValues<dim> Assembly::Scratch::pressure_rot_step< dim >::fe_velocity_values`
- 6.14.2.6 `template<int dim> std::vector<Tensor<2,dim> > Assembly::Scratch::pressure_rot_step< dim >::grad_vel_sol_values`
- 6.14.2.7 `template<int dim> std::vector<double> Assembly::Scratch::pressure_rot_step< dim >::phi_p`
- 6.14.2.8 `template<int dim> std::vector<double> Assembly::Scratch::pressure_rot_step< dim >::pre_sol_values`
- 6.14.2.9 `template<int dim> std::vector<SymmetricTensor<2,dim> > Assembly::Scratch::pressure_rot_step< dim >::symm_grads_vel_sol`

The documentation for this struct was generated from the following file:

- [/Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/assembly_copydata.h](#)

6.15 Assembly::Scratch::projection_step< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```


Public Member Functions

- [projection_step](#) (const FiniteElement< dim > &fe_auxiliary, const Mapping< dim > &auxiliary_mapping, const Quadrature< dim > &quadrature, const UpdateFlags auxiliary_update_flags, const FiniteElement< dim > &fe_velocity, const Mapping< dim > &velocity_mapping, const UpdateFlags velocity_update_flags, const FiniteElement< dim > &concentr_fe, const Mapping< dim > &concentr_mapping, const UpdateFlags concentr_update_flags)
- [projection_step](#) (const [projection_step](#) &data)

Public Attributes

- FEValues< dim > [fe_auxiliary_values](#)
- FEValues< dim > [fe_velocity_values](#)
- FEValues< dim > [concentr_fe_values](#)
- std::vector< Tensor< 1, dim > > [grads_phi_p](#)
- std::vector< double > [phi_p](#)
- std::vector< Tensor< 2, dim > > [grad_vel_n_plus_1_values](#)
- std::vector< double > [concentr_values](#)
- std::vector< double > [div_vel_values](#)

6.15.1 Constructor & Destructor Documentation

6.15.1.1 `template<int dim> Assembly::Scratch::projection_step< dim >::projection_step (const FiniteElement< dim > & fe_auxiliary, const Mapping< dim > & auxiliary_mapping, const Quadrature< dim > & quadrature, const UpdateFlags auxiliary_update_flags, const FiniteElement< dim > & fe_velocity, const Mapping< dim > & velocity_mapping, const UpdateFlags velocity_update_flags, const FiniteElement< dim > & concentr_fe, const Mapping< dim > & concentr_mapping, const UpdateFlags concentr_update_flags)`

6.15.1.2 `template<int dim> Assembly::Scratch::projection_step< dim >::projection_step (const projection_step< dim > & data)`

6.15.2 Member Data Documentation

6.15.2.1 `template<int dim> FEValues<dim> Assembly::Scratch::projection_step< dim >::concentr_fe_values`

6.15.2.2 `template<int dim> std::vector<double> Assembly::Scratch::projection_step< dim >::concentr_values`

6.15.2.3 `template<int dim> std::vector<double> Assembly::Scratch::projection_step< dim >::div_vel_values`

6.15.2.4 `template<int dim> FEValues<dim> Assembly::Scratch::projection_step< dim >::fe_auxiliary_values`

6.15.2.5 `template<int dim> FEValues<dim> Assembly::Scratch::projection_step< dim >::fe_velocity_values`

6.15.2.6 `template<int dim> std::vector<Tensor<2,dim> > Assembly::Scratch::projection_step< dim >::grad_vel_n_plus_1_values`

6.15.2.7 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::projection_step< dim >::grads_phi_p`

6.15.2.8 `template<int dim> std::vector<double> Assembly::Scratch::projection_step< dim >::phi_p`

The documentation for this struct was generated from the following file:

- /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/[assembly_copydata.h](#)

6.16 Assembly::CopyData::projection_step< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [projection_step](#) (const FiniteElement< dim > &fe_auxiliary)
- [projection_step](#) (const [projection_step](#) &data)

Public Attributes

- FullMatrix< double > [local_matrix](#)
- Vector< double > [local_rhs](#)
- std::vector< types::global_dof_index > [local_dof_indices](#)

6.16.1 Constructor & Destructor Documentation

6.16.1.1 `template<int dim> Assembly::CopyData::projection_step< dim >::projection_step (const FiniteElement< dim > & fe_auxiliary)`

6.16.1.2 `template<int dim> Assembly::CopyData::projection_step< dim >::projection_step (const projection_step< dim > & data)`

6.16.2 Member Data Documentation

6.16.2.1 `template<int dim> std::vector<types::global_dof_index> Assembly::CopyData::projection_step< dim >::local_dof_indices`

6.16.2.2 `template<int dim> FullMatrix<double> Assembly::CopyData::projection_step< dim >::local_matrix`

6.16.2.3 `template<int dim> Vector<double> Assembly::CopyData::projection_step< dim >::local_rhs`

The documentation for this struct was generated from the following file:

- /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/[assembly_copydata.h](#)

6.17 Assembly::Scratch::relaxation_div_velocity_step< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [relaxation_div_velocity_step](#) (const FiniteElement< dim > &fe_auxiliary, const Mapping< dim > &auxiliary_mapping, const Quadrature< dim > &quadrature, const UpdateFlags auxiliary_update_flags, const FiniteElement< dim > &fe_velocity, const Mapping< dim > &velocity_mapping, const UpdateFlags velocity_update_flags, const FiniteElement< dim > &concentr_fe, const Mapping< dim > &concentr_mapping, const UpdateFlags concentr_update_flags)
- [relaxation_div_velocity_step](#) (const [relaxation_div_velocity_step](#) &data)

Public Attributes

- FEValues< dim > [fe_auxiliary_values](#)
- FEValues< dim > [fe_velocity_values](#)
- FEValues< dim > [concentr_fe_values](#)
- std::vector< Tensor< 1, dim > > [grads_phi_p](#)
- std::vector< double > [phi_p](#)
- std::vector< Tensor< 2, dim > > [grad_vel_n_plus_1_values](#)
- std::vector< double > [concentr_values](#)

6.17.1 Constructor & Destructor Documentation

6.17.1.1 `template<int dim> Assembly::Scratch::relaxation_div_velocity_step< dim >::relaxation_div_velocity_step (const FiniteElement< dim > & fe_auxiliary, const Mapping< dim > & auxiliary_mapping, const Quadrature< dim > & quadrature, const UpdateFlags auxiliary_update_flags, const FiniteElement< dim > & fe_velocity, const Mapping< dim > & velocity_mapping, const UpdateFlags velocity_update_flags, const FiniteElement< dim > & concentr_fe, const Mapping< dim > & concentr_mapping, const UpdateFlags concentr_update_flags)`

6.17.1.2 `template<int dim> Assembly::Scratch::relaxation_div_velocity_step< dim >::relaxation_div_velocity_step (const relaxation_div_velocity_step< dim > & data)`

6.17.2 Member Data Documentation

6.17.2.1 `template<int dim> FEValues<dim> Assembly::Scratch::relaxation_div_velocity_step< dim >::concentr_fe_values`

6.17.2.2 `template<int dim> std::vector<double> Assembly::Scratch::relaxation_div_velocity_step< dim >::concentr_values`

6.17.2.3 `template<int dim> FEValues<dim> Assembly::Scratch::relaxation_div_velocity_step< dim >::fe_auxiliary_values`

6.17.2.4 `template<int dim> FEValues<dim> Assembly::Scratch::relaxation_div_velocity_step< dim >::fe_velocity_values`

6.17.2.5 `template<int dim> std::vector<Tensor<2,dim> > Assembly::Scratch::relaxation_div_velocity_step< dim >::grad_vel_n_plus_1_values`

6.17.2.6 `template<int dim> std::vector<Tensor<1,dim> > Assembly::Scratch::relaxation_div_velocity_step< dim >::grads_phi_p`

6.17.2.7 `template<int dim> std::vector<double> Assembly::Scratch::relaxation_div_velocity_step< dim >::phi_p`

The documentation for this struct was generated from the following file:

- `/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/assembly_copydata.h`

6.18 Assembly::CopyData::relaxation_div_velocity_step< dim > Struct Template Reference

```
#include <assembly_copydata.h>
```

Public Member Functions

- [relaxation_div_velocity_step](#) (const FiniteElement< dim > &fe_auxiliary)
- [relaxation_div_velocity_step](#) (const [relaxation_div_velocity_step](#) &data)

Public Attributes

- FullMatrix< double > [local_matrix](#)
- Vector< double > [local_rhs](#)
- std::vector< types::global_dof_index > [local_dof_indices](#)

6.18.1 Constructor & Destructor Documentation

- 6.18.1.1 `template<int dim> Assembly::CopyData::relaxation_div_velocity_step< dim >::relaxation_div_velocity_step (const FiniteElement< dim > & fe_auxiliary)`
- 6.18.1.2 `template<int dim> Assembly::CopyData::relaxation_div_velocity_step< dim >::relaxation_div_velocity_step (const relaxation_div_velocity_step< dim > & data)`

6.18.2 Member Data Documentation

- 6.18.2.1 `template<int dim> std::vector<types::global_dof_index> Assembly::CopyData::relaxation_div_velocity_step< dim >::local_dof_indices`
- 6.18.2.2 `template<int dim> FullMatrix<double> Assembly::CopyData::relaxation_div_velocity_step< dim >::local_matrix`
- 6.18.2.3 `template<int dim> Vector<double> Assembly::CopyData::relaxation_div_velocity_step< dim >::local_rhs`

The documentation for this struct was generated from the following file:

- /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/[assembly_copydata.h](#)

6.19 UBC_mis_mixing< dim > Class Template Reference

```
#include <class.h>
```

Classes

- struct [Parameters](#)
- class [Postprocessor](#)

Public Member Functions

- [UBC_mis_mixing](#) ([Parameters](#) ¶meters)
- void [run](#) ()

6.19.1 Constructor & Destructor Documentation

6.19.1.1 `template<int dim> UBC_mis_mixing< dim >::UBC_mis_mixing (Parameters & parameters)`

6.19.2 Member Function Documentation

6.19.2.1 `template<int dim> void UBC_mis_mixing< dim >::run ()`

The documentation for this class was generated from the following files:

- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/class.h](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/AMR/amr.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Main/run.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Post_Processing/extract_data.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Post_Processing/post_processing.↵
cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Pre_Processing/mesh_in.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Pre_Processing/read_and_↵
write.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/constructor.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/projection_for_div_↵
velocity.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/setup_dofs.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/solve_hyperbolic_↵
equation.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/solve_ns_equation.cc](#)
- [/Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Support/utilities.cc](#)

Chapter 7

File Documentation

7.1 /Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/assembly↵ _copydata.h File Reference

```
#include "include.h"
```

Classes

- struct [Assembly::Scratch::diffusion_step< dim >](#)
- struct [Assembly::Scratch::relaxation_div_velocity_step< dim >](#)
- struct [Assembly::Scratch::projection_step< dim >](#)
- struct [Assembly::Scratch::pressure_rot_step< dim >](#)
- struct [Assembly::Scratch::concentrMatrix< dim >](#)
- struct [Assembly::Scratch::concentrRHS< dim >](#)
- struct [Assembly::CopyData::diffusion_step< dim >](#)
- struct [Assembly::CopyData::relaxation_div_velocity_step< dim >](#)
- struct [Assembly::CopyData::projection_step< dim >](#)
- struct [Assembly::CopyData::pressure_rot_step< dim >](#)
- struct [Assembly::CopyData::concentrMatrix< dim >](#)
- struct [Assembly::CopyData::concentrRHS< dim >](#)

Namespaces

- [Assembly](#)
- [Assembly::Scratch](#)
- [Assembly::CopyData](#)

7.2 /Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/class.h File Reference

```
#include <fstream>
```

```
#include <iostream>
#include <sstream>
#include <string>
#include <limits>
#include <locale>
#include "include.h"
#include "equation_data.h"
```

Classes

- class [UBC_mis_mixing< dim >](#)
- struct [UBC_mis_mixing< dim >::Parameters](#)

7.3 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/equation_data.h File Reference

```
#include "include.h"
```

Classes

- class [EquationData::Inflow_Velocity< dim >](#)
- class [EquationData::Outflow_Pressure< dim >](#)
- class [EquationData::concentrInletValues< dim >](#)
- class [EquationData::concentrInitialValues< dim >](#)

Namespaces

- [EquationData](#)

Variables

- const double [EquationData::pipe_diameter](#) = 19.05
- const double [EquationData::gravitiy_accelation](#) = 9800
- const double [EquationData::upstream_concentr](#) = 0.0
- const double [EquationData::downstream_concentr](#) = 1.0
- const double [EquationData::kinematic_viscosity](#) = 1.0

7.4 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/include.h File Reference

```
#include <deal.II/base/quadrature_lib.h>
```



```
#include <deal.II/base/logstream.h>
#include <deal.II/base/function.h>
#include <deal.II/base/utilities.h>
#include <deal.II/base/conditional_ostream.h>
#include <deal.II/base/work_stream.h>
#include <deal.II/base/timer.h>
#include <deal.II/base/parameter_handler.h>
#include <deal.II/lac/full_matrix.h>
#include <deal.II/lac/solver_gmres.h>
#include <deal.II/lac/solver_bicgstab.h>
#include <deal.II/lac/solver_cg.h>
#include <deal.II/lac/constraint_matrix.h>
#include <deal.II/lac/block_sparsity_pattern.h>
#include <deal.II/lac/trilinos_block_vector.h>
#include <deal.II/lac/trilinos_sparse_matrix.h>
#include <deal.II/lac/trilinos_block_sparse_matrix.h>
#include <deal.II/lac/trilinos_precondition.h>
#include <deal.II/lac/trilinos_vector_base.h>
#include <deal.II/lac/trilinos_vector.h>
#include <deal.II/lac/trilinos_solver.h>
#include <deal.II/lac/petsc_solver.h>
#include <deal.II/grid/tria.h>
#include <deal.II/grid/grid_in.h>
#include <deal.II/grid/grid_out.h>
#include <deal.II/grid/grid_generator.h>
#include <deal.II/grid/tria_accessor.h>
#include <deal.II/grid/tria_iterator.h>
#include <deal.II/grid/tria_boundary_lib.h>
#include <deal.II/grid/grid_tools.h>
#include <deal.II/grid/grid_refinement.h>
#include <deal.II/grid/filtered_iterator.h>
#include <deal.II/dofs/dof_handler.h>
#include <deal.II/dofs/dof_renumbering.h>
#include <deal.II/dofs/dof_accessor.h>
#include <deal.II/dofs/dof_tools.h>
#include <deal.II/fe/fe_q.h>
#include <deal.II/fe/fe_dgq.h>
#include <deal.II/fe/fe_dgp.h>
#include <deal.II/fe/fe_system.h>
#include <deal.II/fe/fe_values.h>
#include <deal.II/fe/mapping_q.h>
#include <deal.II/numerics/vector_tools.h>
#include <deal.II/numerics/matrix_tools.h>
#include <deal.II/numerics/data_out.h>
#include <deal.II/numerics/error_estimator.h>
#include <deal.II/numerics/solution_transfer.h>
#include <fstream>
#include <iostream>
#include <sstream>
#include <string>
#include <limits>
#include <locale>
#include <deal.II/distributed/solution_transfer.h>
#include <deal.II/base/index_set.h>
#include <deal.II/distributed/tria.h>
#include <deal.II/distributed/grid_refinement.h>
```

7.5 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/include/mismix/parameter.h File Reference

```
#include <fstream>
#include <iostream>
#include <sstream>
#include <string>
#include <limits>
#include <locale>
#include "include.h"
#include "equation_data.h"
#include "class.h"
```

7.6 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/AMR/amr.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

7.7 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/Main/main.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

Functions

- int [main](#) (int argc, char *argv[])

7.7.1 Function Documentation

7.7.1.1 int main (int argc, char * argv[])

7.8 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/Main/run.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

7.9 /Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Post_Processing/extract_data.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

7.10 /Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Post_Processing/post_processing.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

Classes

- class [UBC_mis_mixing< dim >::Postprocessor< dim >](#)

7.11 /Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Pre_Processing/mesh_in.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

7.12 /Users/miramus/work/Devs/miscible_mixing_series/miscible_mixing/source/Pre_Processing/read_and_write.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
#include <boost/iostreams/tee.hpp>
#include <boost/iostreams/stream.hpp>
#include <boost/archive/binary_oarchive.hpp>
#include <boost/archive/binary_iarchive.hpp>
```

7.13 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/constructor.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

7.14 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/projection_↵ _for_div_velocity.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

7.15 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/setup_↵ _dofs.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
#include <deal.II/base/types.h>
```

7.16 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/solve_↵ _hyperbolic_equation.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

7.17 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/Solver/solve_↵ _ns_equation.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```

7.18 /Users/miranus/work/Devs/miscible_mixing_series/miscible_mixing/source/Support/utilities.cc File Reference

```
#include <mismix/include.h>
#include <mismix/equation_data.h>
#include <mismix/assembly_copydata.h>
#include <mismix/class.h>
#include <mismix/parameter.h>
```


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