

[Help](#)

```
#ifndef PDE_TOOLS_H
#define PDE_TOOLS_H

#include "pnl/pnl_vector.h"
#include "pnl/pnl_matrix.h"

/**
 * {defgroup PremiaPDEBoundary to translate domaine from X
 * 0,X1 to [0,1]
 */
/*{*/
typedef struct
{
    double X0; /*!< left point */
    double H; /* !< Step */
} PremiaPDEBoundary;

extern PremiaPDEBoundary premia_pde_boundary_create(double
    X0, double X1);
extern double premia_pde_boundary_real_variable(const Prem
    iaPDEBoundary BP , double X);
extern double premia_pde_boundary_Unit_interval(const Prem
    iaPDEBoundary BP , double X);
/*}*/

/**
 * {defgroup PremiaPDEDimBoundary Vector On boundary
 */
/*{*/
typedef struct PremiaPDEDimBoundary
{
    PremiaPDEBoundary *array;
    /*!< pointer to store the data */
} PremiaPDEDimBoundary;

extern PremiaPDEDimBoundary *premia_pde_dim_boundary_crea
    te_from_int(int dim);

extern PremiaPDEDimBoundary *
```

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premia_pde_dim_boundary_create(const PnlVect *X0,
                                const PnlVect *X1);
extern void premia_pde_dim_boundary_free(PremiaPDEDimBoundary
    **v);

extern double
premia_pde_dim_boundary_eval_from_unit(double(*f)(const PnlVect *),
    const PremiaPDEDimBoundary *BP,
    const PnlVect *X);

extern void
premia_pde_dim_boundary_from_unit_to_real_variable(const
    PremiaPDEDimBoundary *BP,
    PnlVect *X);

extern double
premia_pde_dim_boundary_get_step(const PremiaPDEDimBoundary
    *BP,
    int i);

/*@}*/

typedef struct
{
    double current_step;
    int current_index;
    PnlVect *time;
    int is_tuned;
} PremiaPDETimeGrid;

extern PremiaPDETimeGrid *premia_pde_time_homogen_grid(const
    double T,
    const int N_T);
extern void premia_pde_time_grid_free(PremiaPDETimeGrid **
    TG);
extern void premia_pde_time_start(PremiaPDETimeGrid *TG);
extern int premia_pde_time_grid_increase(PremiaPDETimeGrid
    *TG);
extern double premia_pde_time_grid_step(const PremiaPDETime
    Grid *TG);
extern double premia_pde_time_grid_time(const PremiaPDETime

```

```
Grid *TG);
```

```
#endif
```

## References