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#if defined(PremiaCurrentVersion) && PremiaCurrentVersion < (2008+2) //The "#els
#else
#ifndef FD_OPERATORS_COMMON_H
#define FD_OPERATORS_COMMON_H

#include "
href../../common/math/highdim_solver/fd_solver_h_src.pdf fd_solver.h"

typedef struct _FDOperatorJam
{

    unsigned dim;
    unsigned char L0;
    unsigned char *L1, *L2;
    double L0v, *L1v, *L2v;
    unsigned state[FDSOLVERMAXDIM];

} FDOperatorJam;

typedef int (*FDOperatorJamCoMatricesFillerEqDef_t)(FDOperatorJam *, void *);
typedef int (*FDOperatorJamCoMatricesFillerEqApply_t)(FDSolver *,
    FDOperatorJam *,
    unsigned *coord, void *);

typedef struct _FDOperatorJamCoMatricesFillerData
{

    FDOperatorJam jam;
    FDSolverCoordWalkerData wd;
    unsigned first[FDSOLVERMAXDIM];    // TODO: This two should be thrown away
    unsigned size[FDSOLVERMAXDIM];      // and replaced by an inner walker.
    unsigned offs[FDSOLVERMAXDIM];
    unsigned Ars, Brs;
    unsigned i1, c1, i2, c2;
    int first_run;

    FDOperatorJamCoMatricesFillerEqDef_t eq_def;
    FDOperatorJamCoMatricesFillerEqApply_t eq_apply;
    void *eq_data;
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} FDOperatorJamCoMatricesFillerData;

#define FDOperatorJAM_LEFT 0
#define FDOperatorJAM_CENTER 1
#define FDOperatorJAM_RIGHT 2

#define FDOperatorJAM_RESET_STATE(jam) \
do \
{ \
    unsigned _k; \
    \
    for(_k=0; _k<(jam)->dim; _k++) \
        (jam)->state[_k] = FDOperatorJAM_LEFT; \
    \
} while(0);

//
// Operators mask definition
//

// Constraints:
// - i1 > i2 => i1 > 0
// - c1, c2 in {0,2}
//

#define FDOperatorJAM_L2_ACCESS(jam,i1,c1,i2,c2) \
((jam)->L2 + \
((i1)*(((i1)-1)*2)+(c1))*sizeof(unsigned char)+ \
(((c1)/2)+(((i1))*2))*sizeof(unsigned) + \
2*(i2)*sizeof(unsigned char) + ((c2)>>1)))

#define FDOperatorJAM_L2_COUNTER2(jam,i,c) \
((unsigned *)((jam)->L2 + \
((i)*(((i)-1)*2)+(c))*sizeof(unsigned char) + \
(((c)/2)+(((i)-1)*2)+1)*sizeof(unsigned))))

#define FDOperatorJAM_L2_COUNTER1(jam) (*((unsigned *)((jam)->L2)))

#define FDOperatorJAM_L1_ACCESS(jam,i,c) \
((jam)->L1 + sizeof(unsigned) + 2*(i)*sizeof(unsigned char) + ((c)>>1)))

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#define FDOPERATORJAM_L1_COUNTER(jam) (*((unsigned *)((jam)->L1)))

#define FDOPERATORJAM_L0_ACCESS(jam) ((jam)->L0)

#define FDOPERATORJAM_L0_MARK(jam) FDOPERATORJAM_L0_ACCESS(jam) = 1

#define FDOPERATORJAM_L1_MARK(jam,i,c) \
do \
{ \
    if(!FDOPERATORJAM_L1_ACCESS(jam,i,c)) \
    { \
        FDOPERATORJAM_L1_ACCESS(jam,i,c) = 1; \
        FDOPERATORJAM_L1_COUNTER(jam)++; \
    } \
} \
while(0);

#define FDOPERATORJAM_L2_MARK(jam,i1,c1,i2,c2) \
do \
{ \
    if(!FDOPERATORJAM_L2_ACCESS(jam,i1,c1,i2,c2)) \
    { \
        FDOPERATORJAM_L2_ACCESS(jam,i1,c1,i2,c2) = 1; \
        FDOPERATORJAM_L2_COUNTER1(jam)++; \
        FDOPERATORJAM_L2_COUNTER2(jam,i1,c1)++; \
    } \
} \
while(0);

#define FDOPERATORJAM_L2_VACCESS(jam,i1,c1,i2,c2) \
((jam)->L2v[((i1)*((i1)-1)+(i2))*2+(i1)*(c1)+((c2)/2)])

#define FDOPERATORJAM_L1_VACCESS(jam,i,c) ((jam)->L1v[2*(i)+((c)/2)])

#define FDOPERATORJAM_L0_VACCESS(jam) ((jam)->L0v)

////////////////////////////////////
// Zero-order term

#define FDOPERATORJAM_ZO_SET_MASK(jam) FDOPERATORJAM_L0_MARK(jam)

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////////////////////////////////////
// Time derivatives

// Forward
#define FDOperatorJAM_TDFF_SET_MASK(jam) FDOperatorJAM_LO_MARK(jam)

////////////////////////////////////
// First spatial derivatives

// Upwind (forward)
#define FDOperatorJAM_SDFU_SET_MASK(jam,i) \
do \
{ \
    FDOperatorJAM_L1_MARK(jam,i,FDOperatorJAM_RIGHT); \
    FDOperatorJAM_LO_MARK(jam); \
} \
while(0);

// Centered
#define FDOperatorJAM_SDFC_SET_MASK(jam,i) \
do \
{ \
    FDOperatorJAM_L1_MARK(jam,i,FDOperatorJAM_RIGHT); \
    FDOperatorJAM_L1_MARK(jam,i,FDOperatorJAM_LEFT); \
} \
while(0);

////////////////////////////////////
// Second spatial derivatives

// Uniform, centered
#define FDOperatorJAM_SDSUC_SET_MASK(jam,i) \
do \
{ \
    FDOperatorJAM_L1_MARK(jam,i,FDOperatorJAM_LEFT); \
    FDOperatorJAM_L1_MARK(jam,i,FDOperatorJAM_RIGHT); \
    FDOperatorJAM_LO_MARK(jam); \
} \
while(0);

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// Mixed, centered
#define FDOperatorJAM_SDsmc_SET_MASK(jam,i1,i2) \
do \
{ \
    FDOperatorJAM_L2_MARK(jam,i1,FDOperatorJAM_LEFT,i2,FDOperatorJAM_LEFT); \
    FDOperatorJAM_L2_MARK(jam,i1,FDOperatorJAM_LEFT,i2,FDOperatorJAM_RIGHT); \
    FDOperatorJAM_L2_MARK(jam,i1,FDOperatorJAM_RIGHT,i2,FDOperatorJAM_LEFT); \
    FDOperatorJAM_L2_MARK(jam,i1,FDOperatorJAM_RIGHT,i2,FDOperatorJAM_RIGHT); \
} \
while(0);

// Mixed, centered, Bouchut corrected
#define FDOperatorJAM_SDsmcb_SET_MASK(jam,i1,i2) \
do \
{ \
    FDOperatorJAM_L2_MARK(jam,i1,FDOperatorJAM_LEFT, \
                          i2,FDOperatorJAM_LEFT); \
    FDOperatorJAM_L2_MARK(jam,i1,FDOperatorJAM_RIGHT, \
                          i2,FDOperatorJAM_RIGHT); \
    FDOperatorJAM_L1_MARK(jam,i1,FDOperatorJAM_LEFT); \
    FDOperatorJAM_L1_MARK(jam,i2,FDOperatorJAM_LEFT); \
    FDOperatorJAM_L1_MARK(jam,i1,FDOperatorJAM_RIGHT); \
    FDOperatorJAM_L1_MARK(jam,i2,FDOperatorJAM_RIGHT); \
    FDOperatorJAM_LO_MARK(jam); \
} \
while(0);

//
// Operators value setting
//

////////////////////////////////////
// Zero-order term

#define FDOperatorJAM_ZO_SET_VALUE(jam,v) FDOperatorJAM_LO_VACCESS(jam) += v

////////////////////////////////////
// Time derivatives

// Forward
#define FDOperatorJAM_TDFF_SET_VALUE(jam,v) FDOperatorJAM_LO_VACCESS(jam) += v

```

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////////////////////////////////////
// First spatial derivatives

// Upwind (forward)
#define FDOperatorJAM_SDFU_SET_VALUE(jam,i,v) \
do \
{ \
    FDOperatorJAM_L1_VACCESS(jam,i,FDOperatorJAM_RIGHT) += (v); \
    FDOperatorJAM_L0_VACCESS(jam) += -1.0*(v); \
} \
while(0);

// Centered
#define FDOperatorJAM_SDFC_SET_VALUE(jam,i,v) \
do \
{ \
    FDOperatorJAM_L1_VACCESS(jam,i,FDOperatorJAM_RIGHT) += 0.5*(v); \
    FDOperatorJAM_L1_VACCESS(jam,i,FDOperatorJAM_LEFT) -= 0.5*(v); \
} \
while(0);

////////////////////////////////////
// Second spatial derivatives

// Uniform, centered
#define FDOperatorJAM_SDSUC_SET_VALUE(jam,i,v) \
do \
{ \
    FDOperatorJAM_L1_VACCESS(jam,i,FDOperatorJAM_LEFT) += v; \
    FDOperatorJAM_L1_VACCESS(jam,i,FDOperatorJAM_RIGHT) += v; \
    FDOperatorJAM_L0_VACCESS(jam) += -2.0*(v); \
} \
while(0);

// Mixed, centered
#define FDOperatorJAM_SDSMC_SET_VALUE(jam,i1,i2,v) \
do \
{ \
    FDOperatorJAM_L2_VACCESS(jam,i1,FDOperatorJAM_LEFT, \
                             i2,FDOperatorJAM_LEFT) += 0.25*(v); \
} \

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        FDOOPERATORJAM_L2_VACCESS(jam,i1,FDOOPERATORJAM_LEFT,      \
                                   i2,FDOOPERATORJAM_RIGHT) += -0.25*(v); \
        FDOOPERATORJAM_L2_VACCESS(jam,i1,FDOOPERATORJAM_RIGHT,    \
                                   i2,FDOOPERATORJAM_LEFT) += -0.25*(v); \
        FDOOPERATORJAM_L2_VACCESS(jam,i1,FDOOPERATORJAM_RIGHT,    \
                                   i2,FDOOPERATORJAM_RIGHT) += 0.25*(v); \
    } \
    while(0);

// Mixed, centered, Bouchut corrected
#define FDOOPERATORJAM_SDSMCB_SET_VALUE(jam,i1,i2,v) \
do \
{ \
    FDOOPERATORJAM_L2_VACCESS(jam,i1,FDOOPERATORJAM_LEFT,      \
                              i2,FDOOPERATORJAM_LEFT) += 0.5*(v); \
    FDOOPERATORJAM_L2_VACCESS(jam,i1,FDOOPERATORJAM_RIGHT,    \
                              i2,FDOOPERATORJAM_RIGHT) += 0.5*(v); \
    FDOOPERATORJAM_L1_VACCESS(jam,i1,FDOOPERATORJAM_LEFT) -= 0.5*(v); \
    FDOOPERATORJAM_L1_VACCESS(jam,i2,FDOOPERATORJAM_LEFT) -= 0.5*(v); \
    FDOOPERATORJAM_L1_VACCESS(jam,i1,FDOOPERATORJAM_RIGHT) -= 0.5*(v); \
    FDOOPERATORJAM_L1_VACCESS(jam,i2,FDOOPERATORJAM_RIGHT) -= 0.5*(v); \
    FDOOPERATORJAM_LO_VACCESS(jam) += v; \
} \
while(0);

#endif

#endif //PremiaCurrentVersion

```