

[Help](#)

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#if defined(PremiaCurrentVersion) && PremiaCurrentVersion < (2007+2) //The "#els
#else

#ifndef TreeLRS1D_H_INCLUDED
#define TreeLRS1D_H_INCLUDED

#include "pnl/pnl_vector.h"
#include "math/read_market_zc/InitialYieldCurve.h"

//*****TreeLRS1D structure*****//
typedef struct TreeLRS1D
{
    double Tf;           // Final time of the tree, dt=Tf/Ngrid
    int Ngrid;           // Number of time step in the TreeLRS1D

    PnlVect *t;          // Time step grid, from t[0] to T[Ngrid].

    PnlVect *phi;

} TreeLRS1D;

//***** Datas specific to Hull and White *****//
typedef struct ModelLRS1D
{
    double Sigma;
    double Rho;
    double Kappa;
    double Lambda;

} ModelLRS1D;

//***** Fonctions relatives a la construction de l'arbre *****//

int SetTimegridCapLRS1D(TreeLRS1D *Meth, int NtY, double current_date, double TO

//Construction of the time grid
int SetTimegridZCbondLRS1D(TreeLRS1D *Meth, int n, double current_date, double T

```

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// Construction of the time grid
int SetTimegridLRS1D(TreeLRS1D *Meth, int n, double current_date, double T);

void SetTreeLRS1D(TreeLRS1D *Meth, ModellRS1D *ModelParam, ZCMarketData *ZCMarketData);

double r_to_y(ModelLRS1D *ModelParam, double r);

double y_to_r(ModelLRS1D *ModelParam, double y);

/*Compute m, mean of  $Y = \log(r/\sigma)$ */
double mean(double time, double Y, double Phi, ZCMarketData *ZCMarket, ModellRS1D *ModelParam);

void probabilities(double date, double y_ij, double phi_ij, double lambda, double sigma);

int indice(int i, int h);
double phi_value(TreeLRS1D *Meth, int i, int h, int j); // i>1 , j=0,1,2
double Interpolation(TreeLRS1D *Meth, int i, int h, PnlVect *OptionPriceVect2, double Y);
double MeanPrice(TreeLRS1D *Meth, int i, int h, PnlVect *OptionPriceVect2);
int number_phi_in_box(int i, int h);
int index_tree(int i, int h, int j);

int indiceTimeLRS1D(TreeLRS1D *Meth, double s); // To locate the date s inf the time grid

int DeleteTimegridLRS1D(struct TreeLRS1D *Meth);

int DeleteTreeLRS1D(struct TreeLRS1D *Meth);

#endif // HW2DTREE_H_INCLUDED
#endif //PremiaCurrentVersion

```