```
   Help
#include <stdlib.h>
#include <math.h>
#include "pnl/pnl_vector.h"
#include "pnl/pnl_fft.h"
#include "math/wienerhopf.h"
#include "cgmy1d_stdr.h"

#include "pnl/pnl_cdf.h"
#include"pnl/pnl_random.h"
#include"pnl/pnl_specfun.h"

#if defined(PremiaCurrentVersion) && PremiaCurrentVersion <
     (2012+2) //The "#else" part of the code will be freely av
    ailable after the (year of creation of this file + 2)
static int CHK_OPT(AP_VAR_FFT)(void *Opt, void *Mod)
{
  return NONACTIVE;
}
int CALC(AP_VAR_FFT)(void*Opt,void *Mod,PricingMethod *Met)
{
  return AVAILABLE_IN_FULL_PREMIA;
}
#else
/*////////////////////////////////////////////////////*/

 //=========================================================
    ========================


static int ap_cgmy_var_fft(double alpha,double Spot,
    double Strike, double T,
         double mu, double C,double G,double M,double Y,
    double h, double er, double *ptvar, double *ptcte)

{

  double cnu, lp1, lm1, ptvar1, ptcte1;


  lm1=-M;
```

```
  lp1=G;
  cnu=C*tgamma(-Y);

  var_fft(1, mu, Spot, lm1, lp1,
    Y, Y, cnu, cnu, T, h, Strike, er, alpha, &ptvar1, &pt
    cte1);

  //VaR
  *ptvar = ptvar1;
  //CTE
  *ptcte = ptcte1;

  return OK;
}

//============================================================
    ==========================
int CALC(AP_VAR_FFT)(void*Opt,void *Mod,PricingMethod *Met)
{
  TYPEOPT* ptOpt=(TYPEOPT*)Opt;
  TYPEMOD* ptMod=(TYPEMOD*)Mod;

  return  ap_cgmy_var_fft((ptOpt->PayOff.Val.V_NUMFUNC_1)->
    Par[1].Val.V_RGDOUBLE,ptMod->S0.Val.V_PDOUBLE,
    (ptOpt->PayOff.Val.V_NUMFUNC_1)->Par[0].Val.V_PDOUBLE,
     ptOpt->Maturity.Val.V_DATE-ptMod->T.Val.V_DATE,
       ptMod->Mu.Val.V_DOUBLE,ptMod->C.Val.V_PDOUBLE,ptMod-
    >G.Val.V_DOUBLE,ptMod->M.Val.V_SPDOUBLE,ptMod->Y.Val.V_PDO
    UBLE,
     Met->Par[1].Val.V_SPDOUBLE,Met->Par[0].Val.V_SPDOUBLE
    ,

     &(Met->Res[0].Val.V_DOUBLE), &(Met->Res[1].Val.V_
    DOUBLE));
}


static int CHK_OPT(AP_VAR_FFT)(void *Opt, void *Mod)
{
  if ((strcmp(((Option*)Opt)->Name,"VaRisk")==0))
    return OK;
```

```
  return WRONG;
}

#endif //PremiaCurrentVersion
static int MET(Init)(PricingMethod *Met,Option *Opt)
{
  static int first=1;

  if (first)
    {
      Met->HelpFilenameHint = "AP_VAR_FFT";
      Met->Par[0].Val.V_PDOUBLE=2.0;
      Met->Par[1].Val.V_PDOUBLE=0.0001;

      first=0;
    }
  return OK;
}

PricingMethod MET(AP_VAR_FFT)=
{
  "AP_VAR_FFT",
  { {"Scale of logprice range", DOUBLE, {100}, ALLOW},
    {"Space Discretization Step",DOUBLE,{500},ALLOW},
    {" ",PREMIA_NULLTYPE,{0},FORBID}},
  CALC(AP_VAR_FFT),
  {{"Value At Risk",DOUBLE,{100},FORBID},
   {"Conditional Tail Expectation ",DOUBLE,{100},FORBID},
   {" ",PREMIA_NULLTYPE,{0},FORBID}},
  CHK_OPT(AP_VAR_FFT),
  CHK_split,
  MET(Init)
};
```

References