merhes1d

1   Description

This model is given by, The evolution process of the Heston model, for the stochastic volatility, and Merton model, for the jumps, is:

$$\begin{cases} \frac{dS_t}{S_t} & = & (r-d)dt + \sqrt{V_t}dW_t^1 + (e^J - 1)dN_t \\ dV_t & = & \kappa(\theta - V_t)dt + \sigma_v\sqrt{V_t}dW_t^2 \\ S(t=0) & = & S_0 \\ V(t=0) & = & V_0 \end{cases}$$

where $d < W^1, W^2 >_t = \rho dt$ and $J \sim N(m, v)$.

2   Code Implementation

```
#ifndef _MERHES1D_H
#define _MERHES1D_H

#include "optype.h"
#include "var.h"
#include "error_msg.h"
#include "enums.h"

#define TYPEMOD MERHES1D

/*1D MERTON-HESTON World*/
typedef struct TYPEMOD{
  VAR T;
  VAR S0;
  VAR Divid;
  VAR R;
```

```
    VAR Sigma0;
    VAR MeanReversion;
    VAR LongRunVariance;
    VAR Sigma;
    VAR Lambda;
    VAR Mean;
    VAR Variance;
    VAR Rho;
} TYPEMOD;


#endif
```