

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
```