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# stein1d

## 1 Description

This model is given by,

$$\begin{aligned} dS_t &= rS_t dt + v_t S_t dW_t^1, \\ dv_t &= k(\theta - v_t)dt + \sigma dW_t^2, \end{aligned}$$

where  $W^1$  and  $W^2$  are two correlated brownian motions with  $\langle W^1, W^2 \rangle_t = \rho t$ , and  $k, \theta$  and  $\sigma$  are constants.

## 2 Code Implementation

```
#ifndef _STEIN1D_H
#define _STEIN1D_H

#include "optype.h"
#include "var.h"

#define TYPEMOD STEIN1D

/*1D STEIN World*/
typedef struct TYPEMOD
{
    VAR T;
    VAR S0;
    VAR Divid;
    VAR R;
    VAR Sigma0;
    VAR MeanReversion;
    VAR LongRunVariance;
```

```
VAR Sigma;  
VAR Rho;  
} TYPEMOD;
```

```
#endif
```

## References