EarthCoordinates

```
domain = "Signal";
displayName = "EarthCoordinates";
brief = "Calculates earth coordinates";
componentType = "ComponentSignal";
author = "Petter Krus <petter.krus@liu.se>";
affiliation = "Division of Fluid and Mechatronic Systems, Linköping University";
SetFilenames[defaultPath, domain, displayName];
ResetComponentVariables[];
```

```
file
```

```
C:\HopsanTrunk\HOPSAN++\ComponentLibraries\defaultLibrary\Special\AeroComponents\
    SignalEarthCoordinates.hpp
```

```
Transformi = 1;
```

```
outputVariables = {
    {timeE, 0., double, "sec", "effective time"},
    {longitude, 0., double, "m", "Effective x-position"},
    {lattitude, 0., double, "m", "Effective y-position"}
  };
```

```
inputParameters = {
    {R, 6367500., double, "m", "Earth radius"}
  };
```

```
inputVariables = {
    {timecomp, 1., double, "", "time compression rate"},
    {vxcg, 0., double, "m/s", "northward speed"},
    {vycg, 0., double, "m/s", "eastward speed"}
  };
```

Convertion factor from degrees to radians

$$d2r = \frac{N[Pi, 6]}{180}$$

```
0.0174533
```

Convertion factor from radians to degrees

```
r2d = ───────
        180
       N[Pi, 6]
```

```
57.2958
```

```
systemVariables = {lattitude, longitude, timeE};
```

```
systemEquationsDa = {
                                      vxcg
    Der[lattitude] - timecomp * r2d ─────,
                                       R
                                    r2d vycg
    Der[longitude] - timecomp * ──────────────────,
                                 R Cos[d2r lattitude]
    Der[timeE] - timecomp
   };
```

```
1 / Cos[x]
```

```
SecL[x]
```

```
boudaryEquations = {};
```

```
variableLimits = {};
```

```
Compgen[file]
```