Kamodo Installation Instructions

In conda command prompt:

1. Move to the directory where you want the Kamodo package to be stored.

1*. If you wish to create a new environment, use this command; otherwise, skip this step:

```
conda create -n Kamodo_env python=3.7
```

2. Add the packages needed by the CCMC readers to the desired environment (replace 'Kamodo_env' with your environment name):

```
conda install -n Kamodo_env -c conda-forge netCDF4 xarray dask astropy ipython
```

3. Activate the desired environment.

```
conda activate Kamodo_env
```

4. Install remaining dependencies:

```
python -m pip install --upgrade spacepy
python -m pip install hapiclient
```

5. Download Kamodo to the current directory:

```
git clone https://github.com/nasa/Kamodo.git
```

6. Install the Kamodo package. (Check the directory structure before using this command. The ./Kamodo directory should contain the kamodo_ccmc directory.)

```
python -m pip install ./Kamodo
```

Testing commands from ipython or notebook session:

```
from kamodo import Kamodo
k = Kamodo()
import kamodo_ccmc.flythrough.model_wrapper as MW
MW.Model_Variables('OpenGGCM_GM')
```

Correct output:

```
The model accepts the standardized variable names listed below.
-----------------------------------------------------------------------------------
B_x : '['x component of magnetic field', 0, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'nT']'
B_y : '['y component of magnetic field', 1, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'nT']'
B_z : '['z component of magnetic field', 2, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'nT']'
B1_x : '['x component of magnetic field (on grid cell faces)', 3, 'GSE', 'car', ['time', 'x', 'x', 'x'], 'nT']'
B1_y : '['y component of magnetic field (on grid cell faces)', 4, 'GSE', 'car', ['time', 'y', 'y', 'y'], 'nT']'
B1_z : '['z component of magnetic field (on grid cell faces)', 5, 'GSE', 'car', ['time', 'z', 'z', 'z'], 'nT']'
E_x : '['x component of electric field (on grid cell edges)', 6, 'GSE', 'car', ['time', 'x', 'x', 'x'], 'mV/m']'
E_y : '['y component of electric field (on grid cell edges)', 7, 'GSE', 'car', ['time', 'y', 'y', 'y'], 'mV/m']'
E_z : '['z component of electric field (on grid cell edges)', 8, 'GSE', 'car', ['time', 'z', 'z', 'z'], 'mV/m']'
V_x : '['x component of plasma velocity', 9, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'km/s']'
V_y : '['y component of plasma velocity', 10, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'km/s']'
V_z : '['z component of plasma velocity', 11, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'km/s']'
N_plasma : '['plasma number denstity (hydrogen equivalent)', 12, 'GSE', 'car', ['time', 'x', 'y', 'z'], '1/cm**3']'
eta : '['resistivity', 13, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'm**2/s']'
P_plasma : '['plasma pressure', 14, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'pPa']'
J_x : '['x component of current density', 15, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'muA/m**2']'
J_y : '['y component of current density', 16, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'muA/m**2']'
J_z : '['z component of current density', 17, 'GSE', 'car', ['time', 'x', 'y', 'z'], 'muA/m**2']'
```