

Instructions for Downloading, Compiling, and Running sphereCLAW by J.A. Rossmanith

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```

Step 1. Download CLAWPACK (version 4.3) source code:

<http://depts.washington.edu/clawpack/clawpack-4.3/>

Detailed instructions can be found at

<https://depts.washington.edu/clawpack/users/index.html>

Step 2. Download sphereCLAW source code:

<http://dogpack-code.org/clawpack/sphereCLAW/>

Step 3. Configure and compile sphereCLAW main library:

- Create a path to sphereCLAW. For example in bash you would modify your `.bashrc` file by adding a line of the following form:

```
export sphereCLAW = /XXXX/YYYYY/sphereCLAW
```

where XXXX and YYYY need to be replaced by the correct sub-directories.

- Move into sphereCLAW library directory: `cd $sphereCLAW/lib/`
- Compile by typing: `make`

Step 4. Compile and run one of the examples:

- Change directories to one of the examples. For example type:

```
cd $sphereCLAW/advection/solid_body_rot/
```

- Compile by typing: `make`
- Run by typing: `./xclaw`
- After completion the code will have created several output files in the sub-directory `output/`

Step 5. Plot the results. For each example a MATLAB script entitled `plotq.m` is provided. If the software package MATLAB (<http://www.mathworks.com>) is available to you:

- Open MATLAB and move into the correct `sphereCLAW` example directory.
- Add the following directory to your MATLAB path by typing the following in a MATLAB window:

```
path(path, '/XXXX/YYYY/sphereCLAW/matlab'),
```

where `XXXX` and `YYYY` need to be replaced by the correct sub-directories.

- Execute the plotting script by typing: `plotq`

Step 6. Modify the input files. There are two main input files that can be modified for your specific problem:

`claw2ez.data` – Set number of points, CFL number, ... (see `CLAWPACK` instructions for more details)

`setprob.data` – Set parameter values to turn on/off parallel transport and orthonormalization and set gravitational and Coriolis constants

For more information we refer you to the article:

J.A. Rossmannith, A wave propagation method for hyperbolic systems on the sphere, *Journal of Computational Physics*, Volume **213**, pp. 629–658, 2006.