Daily Research Report

Jeffrey Severino
University of Toledo
Toledo, OH 43606
email: jseveri@rockets.utoledo.edu

June 8, 2022

1   Current Research Direction

The goal here is to stop running SWIRL on Tuesday, June 14th. All the data that will be needed for the thesis needs to be final.

2   Research Performed

The Fortran F/OSS Programmers Group has released a utility called ford that automatically generates FORTRAN documentation. The installation details (2 commands) are provided in the README file on the github page here. The output is an HTML link that serves as user manual for the code. The workflow is quite simple. After installation of `ford`, a `project-file.md` is used as a way of formatting the output of `ford`. Initally, it can just be created using a `touch` command in the source directory. Right now it is blank. Then, from within the source directory the command,

```
ford -d . project-file.md
```

will generate a `doc/` directory with the HTML file and other goodies. To make comments register to `ford` from within your FORTRAN code, simply comment with `!!` instead of `!`. The output will be `index.html` and can be opened in linux using `xdg-open`. The home page is included in this directory.

As I wrap up my SWIRL code work, I now know a method of documentation that will guide the user in using the code moving forward.

3   Issues and Concerns

This does count as refactoring and should not be done simultaneously. Comments will be added as I finish up data analysis. It is more important that the framework is in place. The comments can be improved after the thesis is complete unless It is okay to put my code in the Thesis itself.

One issue I am having is that LAPACK gives an odd error at high number of iterations and the error is a `SIGFPE` from within the `f90_zggev.f90 INTERFACE SUBROUTINE`. Catching this error has been a bit brutal.

4   Planned Research

Finish write up on MMS, the data is gathered, but writing about it is a challenge. The doubling of grid points per iteration makes the code quite long to run. . .