

Weekly Catchup

Weixiong Zheng

April 3, 2018

1 Updates on previous goals

Previous goals include redesigning BARTDriver and help Marissa on debugging.

2 Progress up to now

The BARTDriver re-implementation was slowed down because of the stuck PR reviewing as Josh leaving for the new baby. Meanwhile, some wonderful things came during the spring recess.

The biggest progress is that I found out the error claimed as initial cell error. It was a serendipity that I found out doing calculations using even parity equation without reflective boundary condition imposed actually have consistent results however many processors are used. Figure 1 is an example of 384-cell domain decomposed to seven processors along with the corresponding global scalar flux. Figure 2 demonstrates the efficacy of distributing solutions with

$$n_cell \% n_proc \neq 0$$

.

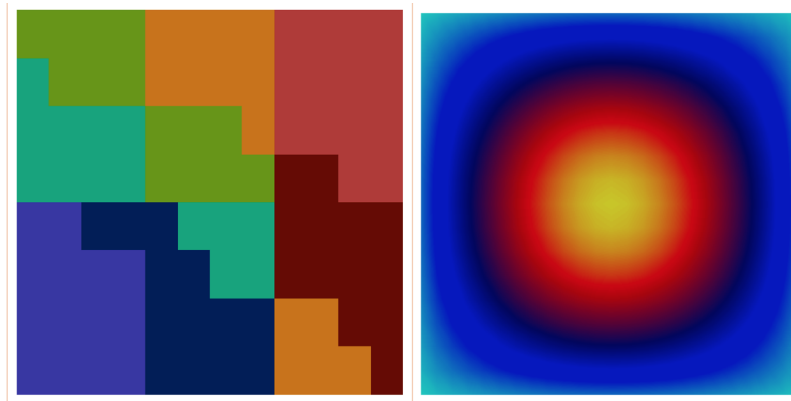


Figure 1: Demo of calculation on 7 processors for 384 cells.

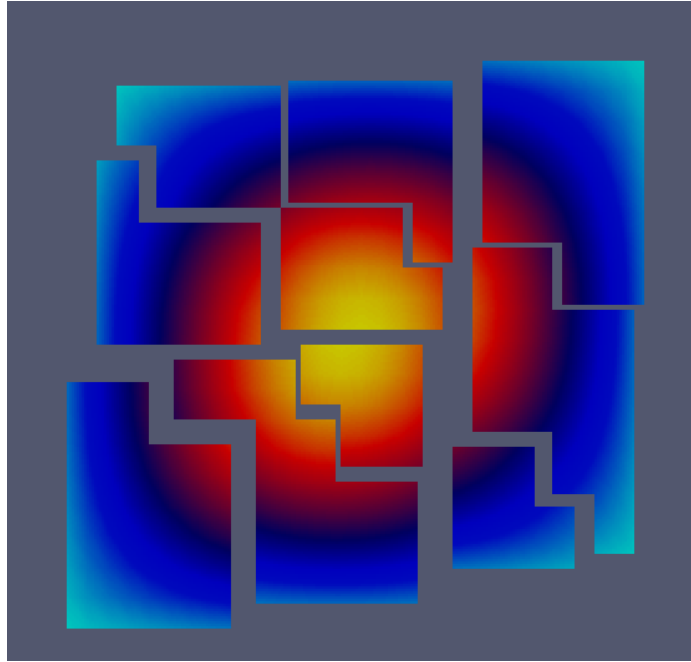


Figure 2: Solutions distributed on decomposed subdomains.

The other accomplishment is that a trial has been successfully done in producing fuel pin using deal.II functions. Before, it was claimed that doing fuel-pin resolved calculations need third-party libraries to generate the mesh. Now, it is hopeful that with reasonable amount of work pin-resolved mesh can be generated just as structured mesh in BART. Figure 3 is a demo of a bunch of `C5G7` pins. This functionality will appear soon in BART.

3 Things you need from Rachel

4 Goals/Things will be going on

It is a special time that Josh will not be able to review the code. I will keep on going however to restart the BART with:

- new/more reasonable designs of classes/namespaces during restart.
- adding unstructured mesh functionality.
- see if I can help Marissa get through the bugs.

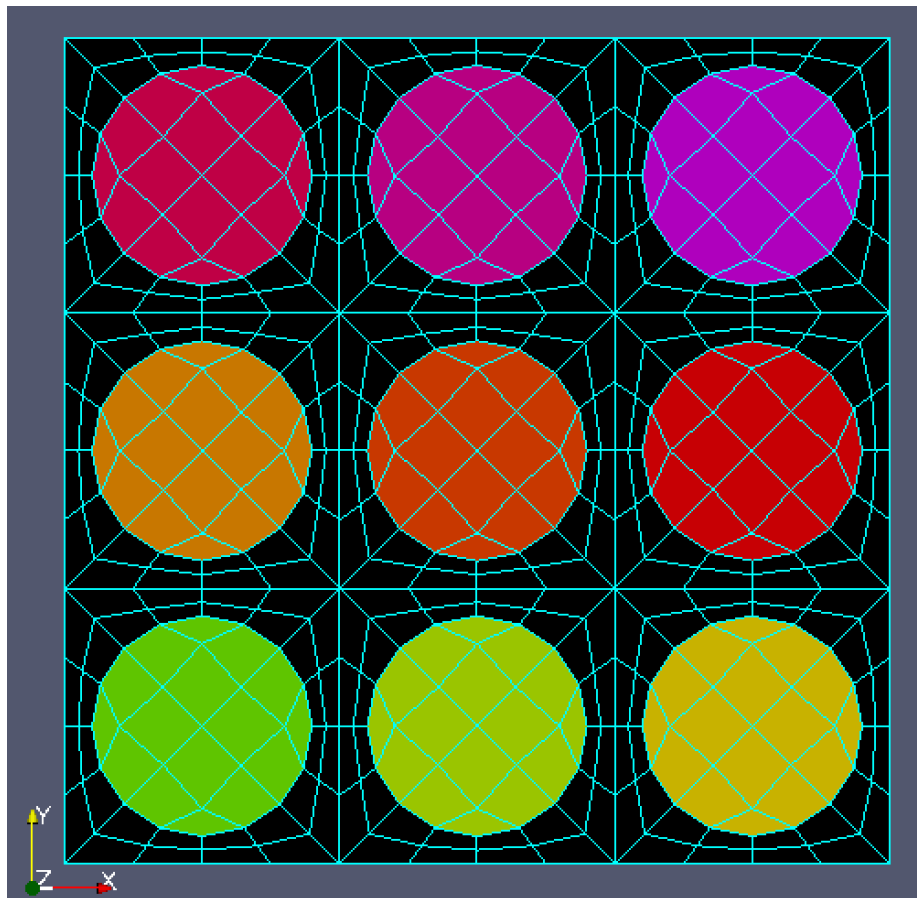


Figure 3: Fuel pins