

Subject: 5/20 Summary
From: Erich Herzig <eherzig@uw.edu>
Date: 5/20/20, 17:17
To: Ed Waddington <edw@uw.edu>

Hi Ed,

Here's my notes for today:

We began by going over the homework, and then we looked at non-uniform grids.

First, we consider curvilinear orthogonal boundaries. In this case, the two coordinates are curved, but meet at right angles. The finite volumes act similarly to before, but along curved lines.

To model a glacier on a curved bed, we could use curved coordinates so that the z coordinates are curved to conform to this surface. Then to get x values that are normal we need to use metric tensors.

Then we can use scale factors, which relate this new coordinate system to a uniform coordinate system for modelling.

Then we saw an example of how a past student used curvilinear coordinates to model a glacier on Mt. St. Helens and to an ice sheet in Antarctica.

Next, we considered a Block structured mesh. In this case, you split up the grid into a higher resolution grid at areas of interest. It is important to get the fluxes right across these changes in grid size.

In an unstructured grid, a grid can be drawn in any shape made up of polygons. In this case we can use nodes at the centers of the volumes, or at the vertexes where the boundaries of the volumes meet. This method however, means you must do complex calculations to get the fluxes.

Best,

Erich