ESS 533 Dynamics of Ice and Snow
Highlights of April 2, 2018
Brita Horlings

We finished defining strain, and discussed approximations for both small strains and finite, large strains (the Taylor series approximation and logarithmic approximation).

We introduced the strain tensor, where the subscript i represents the direction of deformation and j represents the face that the deformation affects. We also discussed how this strain tensor would be different for normal and shear strain (for example, diagonal components).

We then discussed the big picture ideas behind the Alley paper, addressing why flow laws, grain growth, fabric, and energetics matter. In order to relate strain rate to stresses in ice-flow modeling, we must have a flow law, and grain growth, fabric, and energetics all are important in defining a flow law. In other words, these factors control deformation.

We also discussed terminology used in the paper, such as the Burgers vector, dislocation separation, activation energy, etc. and derived the common flow law for ice from equations that represent a smaller scale description of deformation (using dislocation velocity, dislocation density, and other such variables).