**Task 1**:

* Here, DAS is meant to measure (static) strain, but there is no strain in the H5 fields. Use other fields to calculate the axial strain, in a time sequence. Describe two ways that you can calculate the strain from the other data.

Method 1:

Method 2:

* A heat plot of the strain, horizontal axis being the axial-(x) dimension [m], vertical axis being time (s), and brightness being the axial stain.

Figure 1: strain heat plot.

**Task 2:**

* From the fracture data, approximate a sequence of (effective) fracture radius, fracture volume, and average fracture width. Explain how you approximate these fracture attributes.

radius:

volume:

average width:

* Sample two strain sequences, one at the intersection of the HF and DAS trace, and the other off the intersection by 10 meters. Make two sets of plots for the two strain sequences (str1 and str2) respectively, horizontal axis being the strains and vertical axis being the fracture attributes, including the radius, volume, the fracture width at the intersection (mouth), and the average width. **Note**, sample the strain and fracture attributes where the fracture volume is nonzero. This will make the plots more informative.

Figure 2: str1 vs fracture radius.

Figure 3: str2 vs fracture radius.

Figure 4: str1 vs fracture volume.

Figure 5: str2 vs fracture volume.

Figure 6: str1 vs average and intersection (mouth) fracture widths.

Figure 7: str2 vs average and intersection (mouth) fracture widths.

**Questions**

* When the fracture stays closed, why the strains still change?
* From the Task 2 plots, which strain sequence is suited for measuring which fracture attributes, and why?
* Can such strain data uniquely determine a disk-shaped fracture of a uniform width, and why?