1. Background and Objective

**Background:**
Recent studies have proposed the use of an empirical correlation between Sr/Y and La/Yb ratios and the formation depth of arc magmas to model the changes in crustal thickness over time. Other studies have brought to light sampling biases and inconsistencies in this methodology when applied globally.

**Objective:**
To use generalized depleted mantle/slab melts and their resulting trace element compositions to examine the reliability of Sr/Y and La/Yb ratios as a tool for ancient arc reconstruction.

2. Sampled Areas

Fig. 1: Locations of compiled arc lavas (outlined in red). Farner & Lee (2017)

3. Methodology

- Assimilate a generalized depleted mantle with 2% slab fluid to create a bulk composition.
- Simulate the mantle/slab melt at each of our P and T regimes with PELE.
- Compare derived Sr/Y and La/Yb ratios from resulting melt compositions to natural data

4. Least-Square Regression

**Sr/Y vs. P** we found to have a linear regression, while **La/Yb vs. P** regressed exponentially

**References**


5. Comparison and Results

**Trace element ratios** from the collected natural data are significantly higher than those from the model: nearly **5x** for Sr/Y and nearly **2x** for La/Yb.

6. Discussion

- For this disparity between datasets to exist, factors aside from initial depth must influence the trace element composition of surface arc magma.
- Due to the existence of impacting factors, we can conclude that the use of Sr/Y and La/Yb for reconstruction of ancient arc crustal thickness is unreliable until further examination into these factors is performed.