LABORATORY EARTHQUAKE ANALYSIS

Olga Tanyuk[1], Daniel Davieau[1], Dr. Michael L. Blanpied[1], Dr. Charles South[1] and Dr. Daniel W. Engels[1]

[1] Southern Methodist University, Dallas TX 75205, USA
[2] **Add Los Alamos, USGS and or Kaggle here?**

Abstract. Earthquakes cause deaths and destruction. The technologies used in the laboratory to simulate and collect earthquake data have improved. In this study we predict the time remaining for imminent laboratory earthquakes more accurately *(or prove our data model or technology improvement is not helping)* than a 2017 Los Alamos National Laboratory (LANL) study[1]. We analyze the data for patterns using geological subject matter expertise, statistical methods and natural intuition. We design a statistical algorithm to model the patterns and predict the time remaining until a laboratory earthquake will occur for given test data. We compare predicted versus actual time remaining to determine our accuracy.
We predicted impending laboratory earthquakes with *accuracy score , hypothesis, statistical results including pvalue/confidence interval and relevent scores are tbd.*
The evidence of this experiment suggests *final results are work in progress*
Be careful not to accidentally plagurize. DO NOT use figures from other publications. Even if you cite it; you are getting into areas where copyright issues arise.

1 INTRODUCTION

In August 2017 the Los Alamos National Laboratory conducted an experiment which predicted the remaining time until *laboratory* earthquakes occur with 90% accuracy[1]. Since then there have been improvements in the technology used to collect and measure seismic signal data*(additional facts to be added?)*. There have also been improvements in computing power*(additional facts to be added?)*. Los Alamos

Given seismic signal data with considerably more a-periodic laboratory earthquake failures and modern computing hardware; we improve on the Los Alamos study[1] to determine when laboratory earthquakes will occur.

Data was attained from a Kaggle Competition sponsored by the Los Alamos National Laboratory: www.kaggle.com/c/LANL-Earthquake-Prediction. The data in this competition is the result of a laboratory simulation.

This is another section. We assume that H is (A_∞, B_∞)-subquadratic at infinity, for some constant ...

Notes and Comments. The first results on subharmonics were ...

2 TUTORIAL MATERIAL

Paper should be tutorial in nature Audience is data scientists of varying levels of knowledge. Keep newer students in mind

3 DATA

Must have section that defines data Use tables and figures to illustrate data attributes

4 METHODS AND EXPERIMENTS

Define algorithms, methods and eperiments DO NOT give play by play of everything we did Dont put code in paper; if anything put in appendix. Put versions of software but nop one cares about how to use technology; just state what we did.

5 RESULTS

Results of experiments Use tables and graphs Use tables and graphs Use tables and graphs Don't forget explanations

6 ANALYSIS

Analyze results. These are NOT conclusions.

7 ETHICS

Discuss ethics of your problem You MUST have ethics section.

8 CONCLUSION

Draw conclusionS (plural, more than one conclusion- minimum of 3) This is NOT a summary section.

References

1. Bertrand Rouet-Leduc, Claudia Hulbert, N.L.K.B.C.J.H.P.A.J.: Machine learning predicts laboratory earthquakes
2. Kaggle, R.: Lanl earthquake prediction