# Visualizing volcanic eruption events
# Visualization Project Report

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## *Abstract*

*In this project, we focused on visualizing the particles generated by volcanic eruptions in 2011 from Grimsvotn Volcano, Puyehue Volcano and Nabro Volcano to monitor their distribution and moving trend. We got a overview of data by browsing the data interactively. We mainly focused on visualizing pathlines of sulfate aerosols, and their relation between tropopause altitudes and stratosphere. We also did volume rendering about XXX.*

## 1 Introduction

Volcanic eruptions emit harmful particles such as ash and sulfate aerosol into the atmosphere. They not only have an immediate effect of air pollution and aviation shutdown, but also influence the Earth's radiation budget and cause profound climate changes. Therefore, it is significant for people to monitor the states and movements of these particles, which is however really tricky if merely based on simulations. In this project, we integrate visualization methods to analyze what particle clouds look like and how they evolve as time goes after certain volcanic eruptions. We focus on an interesting period of the mid of May to end of July 2011, when three volcanoes (Grimsvoetn Volcano, Puyehue-Cordon Caulle Compex, Nabro) erupted, and utilize different types of data measured after these eruptions to conduct visualization and analysis.

## 2 Data

Introduce the data. Who generated it (add references [1, 2])? Is it simulated or measured? What does the data set contain? Classify your data: what kind of grids? what kinds of attributes (quantitative, ordinal, nominal)? is it scalar data, vector data?

## 3 Goals

Which goals did you set for your project and which ones did you achieve? Add a time line.

## 4 Visualizations

Show images of your interactive visualization system and describe the story of your visualizations. Also describe your data preprocessing if applicable.

### 4.1 Interactive Data Browsing

What aspect of the data do you concentrate on? What do you want to show? Justify your choice of the visualization method! How did you implement the visualization? Describe what we see in the visualization. Is the method interactive? What parameters does the method have? What insights did you get from the visualization?

### 4.2 Pathlines and Animation

Same as above.

### 4.3 Volume Rendering

Same as above.

### 4.4 Aerosol in Stratosphere

Same as above.

## 5 Contributions

### 5.1 Minchao Li

What did you contribute to the project?

### 5.2 Zirun Wang

What did you contribute to the project?

### 5.3 Dexin Yang

What did you contribute to the project?

### 5.4 Kaifeng Zhao

What did you contribute to the project?

## 6 Discussion

### 6.1 Limitations

What are the limitations of your approach / your implementation?

### 6.2 Future Work

What would you like to add or study further, if you had more time?

## References


[1] F. LastName, F. LastName, and F. LastName. Title of the paper. *Journal in which the paper appeared*, 1(1):1–10, 2000.

[2] F. LastName, F. LastName, and F. LastName. Title of the paper. In *Proceedings of Conference name*, pages 1–10, 2000.