**Title of your Dissertation**

by

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Member 4, title 4, Affiliation 4

*I dedicate this to myself because I have worked very hard on it.*

## ACKNOWLEDGMENTS

You probably also want to thank the Academy. Jk.

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## NOMENCLATURE

**DAGMC** Direct Accelerated Geometry Monte Carlo

**MCNP** Monte Carlo N-Particle transport code

**OBB** oriented bounding box

## ABSTRACT

This is my abstract that gives an overview of how exciting and important my dissertation is. Yay.

# 1 INTRODUCTION

First example of content is this introduction. It is listed as a chapter and included in the main .tex document.

Let's use some acronyms just so they appear in our list in the frontmatter. I work with the Direct Accelerated Geometry Monte Carlo (DAGMC) toolkit. It couples with the Monte Carlo N-Particle (MCNP) code and it uses oriented bounding boxes (OBBs).

# 2 BACKGROUND

Here is another chapter example with sections and subsections.

## 2.1 Monte Carlo Radiation Transport

Blah blah blah.. background information in a section with equations and a reference to MCNP [1].

$$\sigma_x^2 = \frac{\sum (x_i - \bar{x})^2}{N-1}$$
$$\sigma_{\bar{x}}^2 = \frac{\sigma_x^2}{N} \tag{2.1}$$

$$R = \frac{\sigma_{\bar{x}}}{\bar{x}} \tag{2.2}$$

Another quantity of interest to measure computational performance is the figure of merit, defined by Equation 2.3 where $t_{proc}$ is the processor time required for the simulation [1]. It is desirable to have a high figure of merit meaning there is low relative error and low processor time.

$$FOM = \frac{1}{R^2 t_{proc}} \tag{2.3}$$

### 2.1.1 Variance Reduction

As described in Section 2.1, some Monte Carlo radiation transport problems must employ variance reduction techniques to lower the variance $\sigma_{\bar{x}}^2$.

Here is an example figure with a caption (see Figure 2.1).

Here is an example table to appear in list of tables (see Table 2.1). It also uses “num" for formatting numbers.

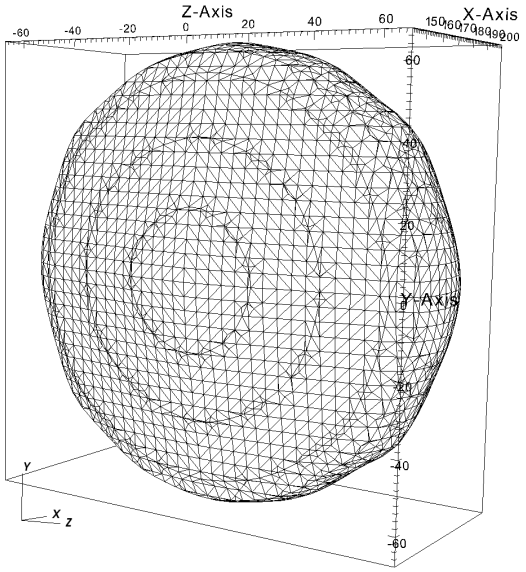


*Figure 2.1: Example surface mesh generated by VisIt of the volume between two isosurfaces.*

*Table 2.1: Neutron Flux Z-values*

| **Reference Mesh** | **Comparison Mesh** | % **voxels with** $z \leq 2\sigma$ |
|---|---|---|
| Analog | Cartesian WW Mesh | 98.34% |
| Analog | WWIG | 98.09% |
| Cartesian WW Mesh | WWIG | 98.13% |

Here is an example list:

1. first

2. second

## 2.2 Summary

In summary, we know stuff.

## BIBLIOGRAPHY

[1] X-5 MONTE CARLO TEAM, *MCNP - A General Monte Carlo N-Particle Transport Code, Version 5: Volume I: Overview and Theory*, Los Alamos National Laboratory, version 5 ed. (February 2008).

# A APPENDIX

Use the appendix for all the extra data and such