Blake Eastman

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Summary

Data analysis using python and MATLAB makes up the largest portion of my research experience. However, for my capstone I also gained experience in experimental design in the context of atomic physics. My broad interest in physics is quantum mechanics; at the academy I took several additional elective classes which delved into topics such as quantum computation and particle physics, all employing quantum mechanics.

Research

GEO Satellite Polarimetry August 2021 – May 2022
USAFA, CO

- Measured polarization of light reflected from GEO communication satellites using USAFA 16-inch telescope
- Developed MATLAB software to convert raw polarimeter data to polarization vs time and polarization vs position plots
- Compared GEO polarization timeseries to polarization of solar panels and spacecraft materials to identify solar panel, bus, and payload contributions to polarization signature

Silicon Spectroscopy January 2023 – May 2024
USAFA, CO

- Collected spectra of silicon-28, silicon-29, silicon-30 using a 252.4 nm laser to determine isotope shift and scalar polarizability
- Designed and constructed the experimental apparatus to measure silicon scalar polarizability, including 3D printed mounting brackets for parallel conducting plates
- Analyzed spectra with Python to compute an experimental value for the scalar polarizability of silicon at this transition

Snapshot Polarimetry for SSA June 2023-July 2023
15 SPSS, HI

- Installed novel snapshot polarimeter (utilizing a vortex halfwave plate) onto a 1-meter sea level telescope
- Simulated polarimetry measurements of target satellites using Python
- Prototyped polarimeter data reduction software in python, tested using aforementioned simulated measurements

Geometric Algebra and Spinors August 2023 – May 2024
USAFA, CO

- Studied alternative formalism to traditional vector algebra known as geometric/clifford algebra
- Applied mathematical structures (rotors and projectors) available in geometric algebra formalism to explore new representations of Weyl and Dirac spinors

Cadet Experience

Outstanding Cadet in Physics May 2024

- Received this award given to the top physics major in the graduating class

Operations Flight Commander January 2024 – May 2024

- Lead a flight of approximately 30 individuals
- Directed elements responsible for ensuring the squadrom met academic, athletic, and drill/ceremony requirements

Diversity and Inclusion Officer / NCOIC August 2022 – December 2023

- Facilitated education and training on Air Force diversity, equity, and inclusion policy for a squadron of 100 individuals

Education

United States Air Force Academy Colorado Springs, CO
B.S. in Physics *June 2020 – May 2024*