




Aidan Winblad

Curriculum Vitae

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EDUCATION

2015 **B.S. in Mathematics**
FORT HAYS STATE UNIVERSITY,
HAYS, KS

2015 **B.S. in Physics**
FORT HAYS STATE UNIVERSITY,
HAYS, KS

2019 **M.S. in Physics**
COLORADO STATE UNIVERSITY,
FORT COLLINS, CO

COMPUTATIONAL PHYSICS EXPERIENCE

- Solved ODE of damped-driven pendulum to show chaotic motion with RK4 using C++
- Simulated a Gaussian Wave packet in 1-D Schrodinger equation infinite square well using Goldberg method and 2-D infinite square well using ADI method using FORTRAN 90
- Solved Heat equation for a 2-D system using SOR using C++
- Propagation of electromagnetic wave in 1-D using FDTD using C++
- Compute eigenvalues and states of Schrodinger equation for 1-D harmonic oscillator using FEM using Python 2.7
- Developed a 2-D (r,z) Focused Gaussian Beam Monte-Carlo Multi-Layer method, with ABCD transforms, for modeling energy deposits into tissue for laser tissue interactions using C++

- Compute eigenvalues and states of a non-trivial topological superconducting triangular island for modeling a potential quantum logic gate said to host Majorana fermion edge modes using Python 3.6
- Compute Floquet values of incident light upon a solid-state structure to produce an effective magnetic field using Python 3.6

PAPERS

- Hokr, B. H., Winblad, A., Bixler, J. N., Elpers, G., Zollars, B., Scully, M. O., Yakovlev, V. V., Thomas, R. J. Accurately modeling Gaussian beam propagation in the context of Monte Carlo techniques. Proc. SPIE (in press)

WORK EXPERIENCE

JANUARY 2012 - MAY 2015

Fort Hays State University (FHSU)

Math and Physics Tutor

Tutor FHSU students attending math or physics courses. General courses include: Statistics, College Algebra, Calculus, Linear Algebra, Differential Equations, Computer Science, and Physics.

AUGUST 2012 - MAY 2015

FHSU Physics Department

Teacher Assistant

Teacher assistant to various physics professor. Responsibilities included grading homework, lab journals and reports, and proctoring exams.

JUNE 2015 - AUGUST 2016

Engility, Fort Sam Houston AFRL

Computational Physicist, Contractor

Responsibilities include: developing new code; simulating laser tissue interactions for damage prediction models, experimental validation, and set safety standards; writing technical reports; and presenting results in presentations, proceedings, and journal articles.

AUGUST 2016 - DECEMBER 2020

CSU Physics Department

Graduate Research and Teacher Assistant

Teach labs and recitations, tutor, grade coursework, and proctor and grade exams. Research for Master's advisor on the topic of Topological Quantum Computing. This entailed both analytic and computational work to show a topological superconducting triangular island can host Majorana fermions edge modes and using an applied magnetic field one could braid the edge modes to achieve fault-tolerant quantum computing.

SOFTWARE SKILLS

BASIC Arduino, Blender, Git,
 LabVIEW, MATLAB,
 Objective-C, Octave,
 ParaView, Swift, Qtplot

INTERMEDIATE Bash/Shell, C/C++,
 FORTRAN 90, Gnuplot,
 LaTeX, Linux, Python 2/3,
 Unix, Vim