PHYS 142/242

Lecture 22: Final Projects

Javier Duarte — March 6, 2024

Course Evaluations!

- https://academicaffairs.ucsd.edu/Modules/Evals?e11230304
- Available until **Wednesday, March 27 at 8:00 AM**
- If we reach above 80% submitted evaluations, extra credit on final projects

Final Presentations

- 1 person per group fill out the form ASAP: https://forms.gle/RVSJ2RNAoAL83n286
- Discuss amongst yourselves then fill it out by Friday lecture
- Limited to 15+5 minutes
- Example presentations from previous years: https://docs.google.com/presentation/d/1jkIBqTkAAXtWCO88Lm4ulzRwCAi8nwUU/edit?usp=sharing&ouid=117156458781940750638&rtpof=true&sd=true
- Presentations will take place Tuesday - Friday in Lab/Lecture
- **All groups are expected to be present to give feedback, etc.**

Part (d)

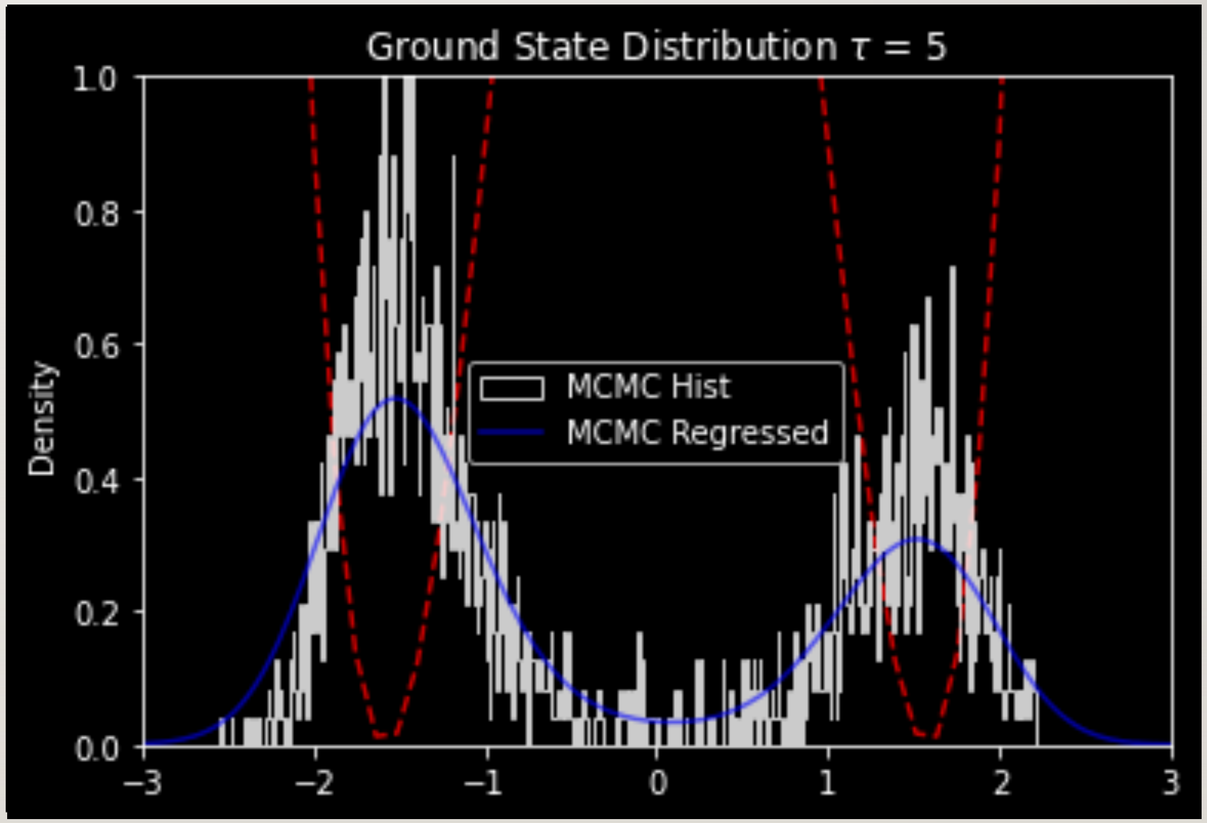
Increasing Tau decreased the average error of our distribution towards the analytical 50/50.

Poor distribution: <500

Decent distribution: 1000

Good distribution: 3000

Great distribution: 10000 ($\tau \rightarrow \infty$)



Final Report

- Template: https://www.overleaf.com/read/drwctbrvmzfs#705aa6
- Due Friday of Finals Week

Manuscript Title: Subtitle

Ann Author* and Second Author†
University of California San Diego

(Group: Double Well Potential with MCMC (A))
(Dated: March 6, 2024)

An article usually includes an abstract, a concise summary of the work covered at length in the main body of the article.

I. INTRODUCTION

Introduce the problem you are solving. Discuss the physics behind the project and introduce the computational methods you will use. Also, mention and cite any papers you use [1].

Describe the main objective of your project.

II. METHODS

Describe methods, e.g. Markov chain Monte Carlo with Metropolis-Hastings algorithm. Here's an example of an equation for the path integral

$$K(x_b, t_b; x_a, t_a) = \int \mathcal{D}x(t) \exp\left[\frac{i}{\hbar}\int_{t_a}^{t_b} L(x(t))dt\right] \quad (1)$$

Make sure you define all variables in any equations you write!

Describe and discuss any parameters you choose for your computational method, e.g. burn-in steps, etc.

Provide the link to your software in GitHub repository [2].

III. RESULTS

Report the results of your simulations. Add figures showing your results, as in Fig. 1.

Discuss significance of results. In particular answer questions posed in the assignment, e.g. explain the connection to statistical mechanics.

IV. CONCLUSION

Brief summary of the project and results. Describe any lessons learned or possible future work.

V. CONTRIBUTIONS

Briefly describe contributions from each team member.

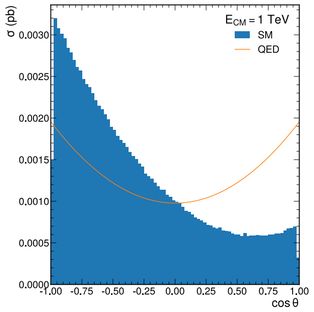


FIG. 1. Describe your figure in full.

ACKNOWLEDGMENTS

Add any acknowledgments (optional).

[1] S. Mittal, M. J. Westbroek, P. R. King, and D. D. Vvedensky, Path integral Monte Carlo method for the quantum anharmonic oscillator, Eur. J. Phys. **41**, 055401 (2020).
[2] J. M. Duarte, UCSD PHYS 142 GitHub (2024).

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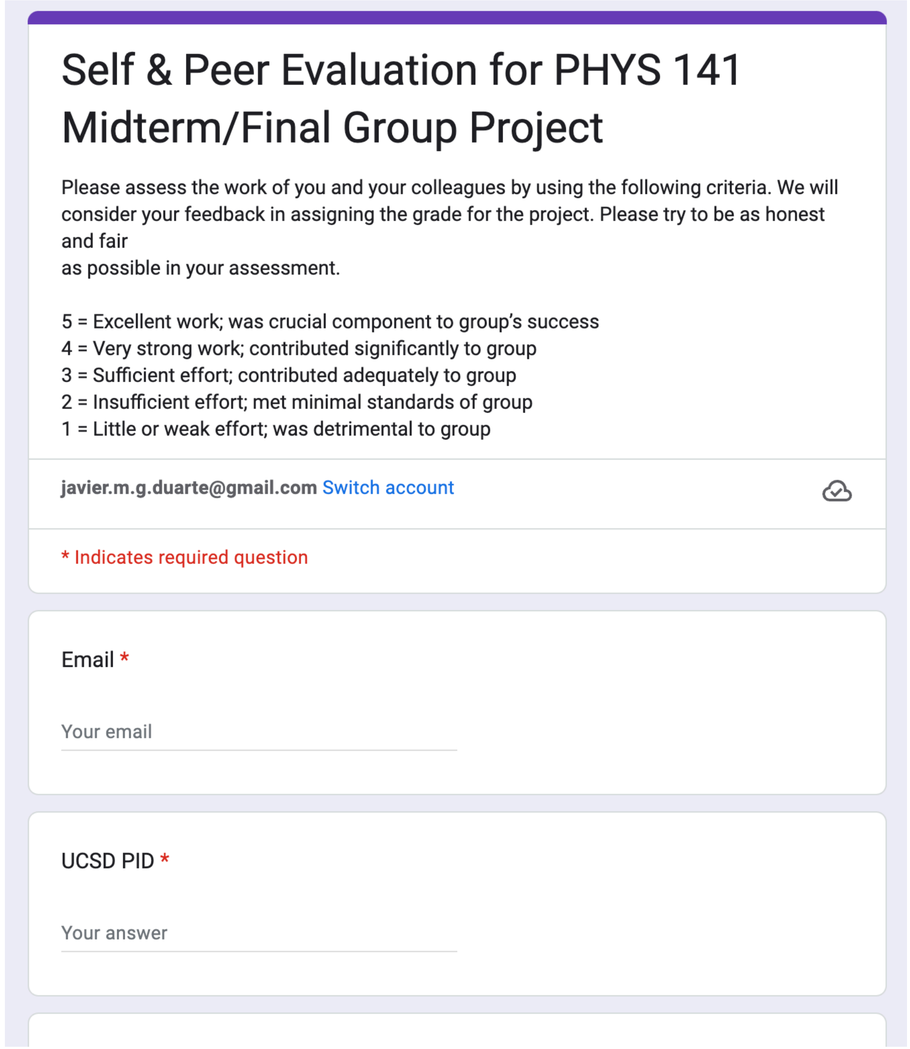
Self & Peer Evaluations

- Form: https://forms.gle/P9C7E9jYrmn4hEHZ7
- Due Friday of Finals Week



Self & Peer Evaluation for PHYS 141 Midterm/Final Group Project

Please assess the work of you and your colleagues by using the following criteria. We will consider your feedback in assigning the grade for the project. Please try to be as honest and fair
as possible in your assessment.

5 = Excellent work; was crucial component to group's success
4 = Very strong work; contributed significantly to group
3 = Sufficient effort; contributed adequately to group
2 = Insufficient effort; met minimal standards of group
1 = Little or weak effort; was detrimental to group

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* Indicates required question

Email *

Your email

UCSD PID *

Your answer