

Abstract

To be written.

This MMSC thesis will further explore general kernel spectral methods for finding equilibrium measures where initial progress made in [Gutleb, Carrillo and Olver 2020](#) and [Gutleb, Carrillo and Olver 2021](#).

Keywords: Equilibrium Measures

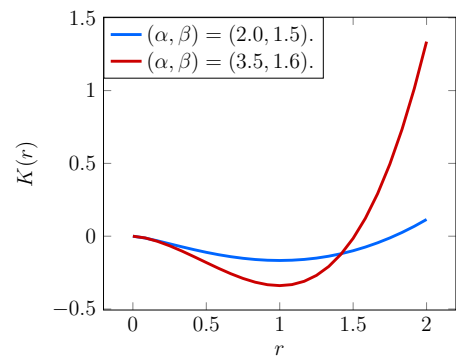
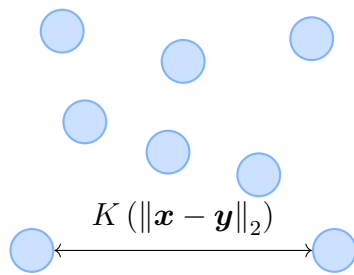
Languages: C++, Julia, Python

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Chapter 1

Introduction



(a) $N = 8$ particles interacting with one another through the potential $K(r)$. **(b)** Plot of attractive-repulsive potential functions $K(r) = \frac{r^\alpha}{\alpha} - \frac{r^\beta}{\beta}$ for different α, β .

Cf. Figure 1.1a and Figure 1.1b.

Just Notes

This chapter's purpose is for the collection of notes, and it will not be included in the final dissertation.

Chapter 2

Conclusion

In the present thesis, we explored the interesting realm of particle-particle interactions. Next to the written part, the reader will find an implementation of the particle simulator, including a Graphical User Interface (GUI), as well as the numerical solver.

Acronyms, Definitions and Theorems

GUI Graphical User Interface

5

Definitions

Theorems

Lemmata

Remarks

Bibliography

- Gutleb, Timon S., José A. Carrillo and Sheehan Olver (Oct. 2020). ‘Computing Equilibrium Measures with Power Law Kernels’. In: *arXiv*. DOI: [10.1090/mcom/3740](https://doi.org/10.1090/mcom/3740). eprint: [2011.00045](https://arxiv.org/abs/2011.00045).
- (Sept. 2021). ‘Computation of Power Law Equilibrium Measures on Balls of Arbitrary Dimension’. In: *arXiv*. DOI: [10.1007/s00365-022-09606-0](https://doi.org/10.1007/s00365-022-09606-0). eprint: [2109.00843](https://arxiv.org/abs/2109.00843).

List of Figures and Tables

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Appendix A – Supplemental Proofs