"Schrödinger operators with magnetic fields and applications to superconductivity"

Graduate seminar on Analysis (S4B2), Summer term 2020

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Tentative list of references/talks

All the chapters listed below are taken from:

S. Fournais and B. Helffer. *Spectral Methods in Surface Superconductivity*, Progress in Nonlinear Differential Equations and Their Applications (2010), Vol. 77, Birkhuser Basel.

- Chapter 1,3: Introduction and preliminary results for magnetic Schrödinger operators; (Taken)
- Chapter 7: Semiclassical methods for the Schrödinger operator with an electric potential; (Taken)
- Chapter 8: Spectrum of magnetic Schrödinger operators with strong magnetic field; (Taken)
- Chapter 10: Ginzburg-Landau functional. Introduction and existence of minimizers; (Taken)
- Chapter 11 (only 2D case) : Ginzburg-Landau functional. Regularity and asymptotic estimates; (Taken)
- Chapter 12 (only 2D case): Nonlinear Agmon estimates.

Some further references

- Chapter 4-5: Spectral analysis for special domains
- Chapter 13: Estimates on the critical field H_{C_3} for the Ginzburg-Landau functional.