Worksheet on:

Superconductivity

by Francisco Lobo

This worksheet follow directly from the journal notes of the same name. These can be found at my personal website at https://franciscolobo1880.github.io/. The majority of the exercises presented herein correspond to proves and results briefly mentioned in the main text, which were not elaborated upon in detail in order to maintain a more fluid reading experience. As supplementary material, there is a GitHub repository at https://github.com/franciscolobo1880/topoSC. There can check the numerical solutions of some of the exercises. This is done in *Julia* using the *Quantica.jl* package by Pablo San-Jose, my PhD advisor. To get started on this check *Quantica.jl*'s repository and it's tutorial at https://github.com/pablosanjose/Quantica.jl.

CONTENTS

Overview of foundational superconductivity theories	4
Unconventional superconductivity theories	5
Introduction to topological superconductivity	6

I. OVERVIEW OF FOUNDATIONAL SUPERCONDUCTIVITY THEORIES

II. UNCONVENTIONAL SUPERCONDUCTIVITY THEORIES

III. INTRODUCTION TO TOPOLOGICAL SUPERCONDUCTIVITY