Probing the Effects of $NbSe_2$ on Few-Layer Rhombohedral Graphite Using Tight-Binding and Density Functional Theory

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Abstract. In recent years, there has been growing interest in the study of the interplay of different superconducting gap opening functions and induced spin-orbit coupling in novel materials, which has led to the discovery of several exotic quantum phenomena. Rhombohedral graphite is a promising candidate for such studies, owing to its unique crystal structure and electronic properties. We investigate the superconducting properties of rhombohedral graphite that is proximitized by a thin film of NbSe2. We use first-principles calculations based on density functional theory to study the electronic properties of this system and employ a combination of analytical and numerical techniques to analyze the interplay between different superconducting gap opening functions and spin-orbit coupling.