

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

The evolution of phases and electronic states in potassium doped coronene film¹ CHAOQIANG XU, XUDONG XIAO, Department of Physics, The Chinese University of Hong Kong, Shatin, Hong Kong, China — Alkali-metal-doped hydrocarbon materials have been found to exhibit improved superconductivity transition temperature T_c relative to the traditional organic superconductors. However, theoretical attempts to understand the superconductivity mechanism in this class of materials are still hindered by the limited experimental information available. In our study, we employed scanning tunneling microscopy (STM) and scanning tunneling spectroscopy (STS) to detect both the structures and the electronic properties of the doped hydrocarbon films at molecular scale. By gradually increasing potassium doping level, the evolution of structures and electronic properties in potassium doped coronene film was then investigated. Particularly, a splitting of the lowest unoccupied molecular orbital (LUMO) state was observed when the LUMO was brought to the Fermi level, giving direct evidence of electronic correlation effect in this system. Our results should contribute to a better understanding of the interaction between coronene molecules and potassium atoms and may shed some light to understand the superconductivity properties of this system.

¹Research Grants Council of Hong Kong (Grant No. 404613)

Chaoqiang Xu
Department of Physics, The Chinese University of Hong Kong, Shatin, Hong Kong, China

Date submitted: 04 Nov 2015

Electronic form version 1.4