

Abstract Submitted  
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**LT-STM/STS studies of clean armchair edge**<sup>1</sup> ZHENG JU, WENHAN ZHANG, WEIDA WU, Department of Physics and Astronomy, Rutgers University, WEIDA WU TEAM — It was predicted and observed that the passivated zigzag edges of graphene host highly localized edge state [1]. This edge state is predicted to be spin-polarized, which is appealing for spintronic applications. In contrast, no edge state was expected at passivated armchair graphene edge. Here we report low temperature scanning tunneling microscopy and spectroscopy (STM/STS) studies of electronic properties of clean monoatomic step edges on cleaved surface of HOPG. Most of step edges are armchair edges, in agreement with previous STM results. We observed only  $(\sqrt{3} \times \sqrt{3})R30^\circ$  superstructure near armchair edges, which has been reported in previous STM studies [2, 3, 4]. On the other hand, no honeycomb superstructure was observed in our STM data. In addition, our STM results reveal an intriguing localized electronic state at clean armchair edges. Spectroscopic and spatial evolution of this edge state will be presented. [1] Fujita et al, JSPJ, 65, 1920, (1996). [2] Niimi et al, PRB, 73, 085421 (2006). [3] Giunta and Keltz, J. Chem. Phys., 114, 1807 (2001). [4] Sakai, et al, PRB, 81, 235417(2010).

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