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Edge effects in Zigzag Graphene Nanoribbons[1] WEN YING RUAN, School of Physics, Georgia Institute of Technology, YIYANG SUN, SHENG BAI ZHANG, Department of Physics, Applied Physics and Astronomy, Rensselaer Polytechnic Institute, Troy, NY 12180, USA, MEI-YIN CHOU, School of Physics, Georgia Institute of Technology, Atlanta, GA 30332, USA, and Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan — Analytical and numerical results based on the tight binding model are presented for zigzag graphene nanoribbons with z1 and $z12_12$ edges. We show the crucial importance of the symmetry of the two edges in determining the electronic structures of the system. Examples of significant band gap narrowings due to symmetry breaking are illustrated.

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