

Abstract Submitted  
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**Parity and valley degeneracy in multilayer graphene**<sup>1</sup> EDWARD MCCANN, Lancaster University, UK, MIKITO KOSHINO, Tokyo Institute of Technology, Japan — The lattice of Bernal (ABA-stacked) trilayer graphene does not satisfy spatial inversion symmetry. Instead, mirror reflection symmetry in the plane of the central graphene layer plays the role of parity, and, owing to this symmetry, the low-energy electronic band structure of Bernal trilayers consists of separate linear, monolayer-like and parabolic, bilayer-like bands. Mirror reflection does not transform between states at the two valleys and is, therefore, unable to guarantee valley degeneracy. We show that this leads to a peculiar Landau level spectrum in Bernal trilayers, with an unusual structure of broken valley degeneracy that is markedly different from monolayer and bilayer graphene. Finally, we explain how this picture is modified in Bernal graphene multilayers with an even or odd number of layers.

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