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Space dependent Fermi velocity in strained graphene FERNANDO DE JUAN, Materials Sciences Division, Lawrence Berkeley National Laboratory, USA, MAURICIO STURLA, MARIA A. H. VOZMEDIANO, Instituto de Ciencia de Materiales de Madrid, CSIC, Spain — We investigate some apparent discrepancies between two different models for curved graphene: the one based on tight binding and elasticity theory, and the covariant approach based on quantum field theory in curved space. We demonstrate that strained or corrugated samples will have a space dependent Fermi velocity in either approach that can affect the interpretation of local probes experiments in graphene. We also generalize the tight binding approach to general inhomogeneous strain and find a vector field proportional to the derivative of the strain tensor that has the same form as the spin connection obtained in the covariant approach.

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