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Nodal Spin Density Wave and band topology of the FeAs based materials HUI ZHAI, LBL, UC Berkeley, YING RAN, FA WANG, ASHVIN VISHWANATH, DUNG-HAI LEE, UC Berkeley — The recently discovered FeAs-based materials exhibit a $(\pi, 0)$ Spin Density Wave (SDW) in the undoped state, which gives way to superconductivity upon doping. Here we show that due to an interesting topological feature of the band structure, the SDW state cannot acquire a full gap. This is demonstrated within the SDW mean-field theory of both a simplified two band model and a more realistic 5-band model. The positions of the nodes are different in the two models and can be used to detected the validity of each model.

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