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The topological properties of the band structure of a three-dimensional topological insulator (TI) are investigated. The TI is modeled as a Dirac semimetal with a gap opening at the Dirac point. The band structure is shown to exhibit a topological phase transition from a Dirac semimetal to a TI as the gap opens. The topological properties are characterized by the Chern number, which is shown to be a topological invariant of the band structure. The Chern number is calculated for the band structure of the TI and is shown to be a non-zero integer, indicating a topological phase. The topological properties are also investigated using the Berry phase and the anomalous Hall effect. The Berry phase is shown to be a topological invariant of the band structure and is related to the Chern number. The anomalous Hall effect is shown to be a topological property of the TI and is related to the Chern number. The topological properties of the TI are also investigated using the Dirac equation and the Dirac semimetal model. The Dirac equation is solved for the TI and the Dirac semimetal model is used to describe the band structure. The topological properties are shown to be robust against disorder and interactions.

Nontrivial topological properties of the band structure of a three-dimensional topological insulator (TI) are investigated. The TI is modeled as a Dirac semimetal with a gap opening at the Dirac point. The band structure is shown to exhibit a topological phase transition from a Dirac semimetal to a TI as the gap opens. The topological properties are characterized by the Chern number, which is shown to be a topological invariant of the band structure. The Chern number is calculated for the band structure of the TI and is shown to be a non-zero integer, indicating a topological phase. The topological properties are also investigated using the Berry phase and the anomalous Hall effect. The Berry phase is shown to be a topological invariant of the band structure and is related to the Chern number. The anomalous Hall effect is shown to be a topological property of the TI and is related to the Chern number. The topological properties of the TI are also investigated using the Dirac equation and the Dirac semimetal model. The Dirac equation is solved for the TI and the Dirac semimetal model is used to describe the band structure. The topological properties are shown to be robust against disorder and interactions.

confined extended

W

N

P

B

T

W

TJ-0-1.154, ...

$$L_{\text{eff}} = L_{\text{eff}} - L_{\text{eff}} \quad (5)$$

$$h_{\text{eff}} = m \times (m \times h_{\text{eff}})$$

$$L_{\text{eff}} = \frac{L_{\text{eff}}}{m} + (h_0 + m_z)z, \quad (1)$$

0 < ... >

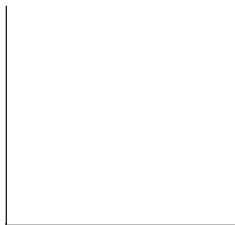
$h_0(x, t)z$ $m_z z, C$ $H,$ $H > M, T$ $L / (Q - 1),$ $|\mu_0 M (Q - 1),$ $M (Q - 1),$ $Q = H / M > 1.$ W $L / (Q - 1)$ $(D, R, 17), F, C / \mathbb{N}$ 19 $27, 17,$ $0.01, Q = 1.25, M = 650 \text{ A/}$ R 12 T W $h_0 = 0, E, (1)$

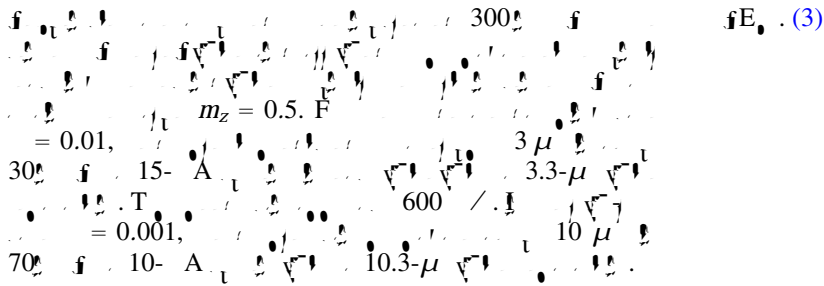
$$\mathcal{N} = \int (1 - \dots) dx, \quad \mathcal{P} = \int (\dots - 1) dx,$$

$$\mathcal{E}_0 = \frac{1}{2} \int (|\dots|^2 + \dots^2 (1 + |\dots|^2)) dx,$$

M \mathcal{N}, \mathcal{P} V $17 T$ $(\mathcal{N}, \mathcal{P})$ $(, V), D$ 13 $+ |V|^2/4 < 1, V = 0, 0 < < 1, V = 0. (2)$

W $< 0.17 T$ $1,$ 0 $20 H$ T $21 W$ 63μ 5 $A,$ $(h_0, |h_0| - 1),$ $h_0,$ T $(, V),$





... $|\nabla h_0|/\alpha \ll 1$... $|h_0|/\alpha < 1$, ... $W > 0$... $\hat{P} < 0$... $(\hat{V} > 0)$... $\hat{m}_{\text{eff}} < \hat{P}/V < 0$. (3)

acceleration ... $\hat{P} = \hat{m}_{\text{eff}}V + \hat{m}_{\text{eff}}\hat{V}$, ... $\hat{P} < 0$, ... $(\hat{V} > 0)$... $\hat{m}_{\text{eff}} < \hat{P}/V < 0$. (5)

$$\hat{m}_{\text{eff}} < \hat{P}/V < 0. \quad (6)$$

... $A > 0.3$... $-1 < h_0 < 0$, ... $(V, \dots) = (0, 0)$... switching separatrix. $(V, \dots) = (0, -h_0)$ $\hat{P} < 0$, ... $(\hat{V} > 0)$... $\hat{m}_{\text{eff}} < \hat{P}/V < 0$. (6)

