

Optical modulation of transport properties of the surface states of 3D topological Insulator under terahertz radiation

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Abstract

We have theoretically studied the modulation of the transport properties of the surface states of the 3D topological Insulator under a time and space dependent field. We obtain transmittance of the surface electrons using the Floquet scattering matrix method which shows perfect transmission for normally incident electrons. Contribution of the side bands to the total the transmission increase as we increase/decrease the amplitude/frequency of modulating field. It is found that the Fabry-Perot resonances in the transmission and correspondingly optical conductivity show modification to the due to the side band modulated optical transition.

References

- [1] Puja Mondal, Sankalpa Ghosh and Manish Sharma (in preparation).
- [2] Y. Li *et al.*, Sci. Rep. **4**, 4624 (2014).

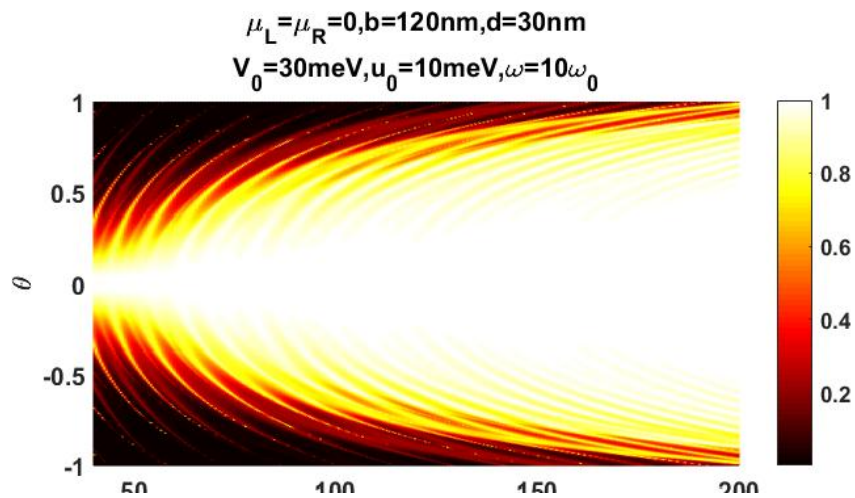


Fig1: Transmission through double barrier in presence of time dependent field. It shows modulation at large angle of incidence. $\omega_0 = 1.525$ THz.

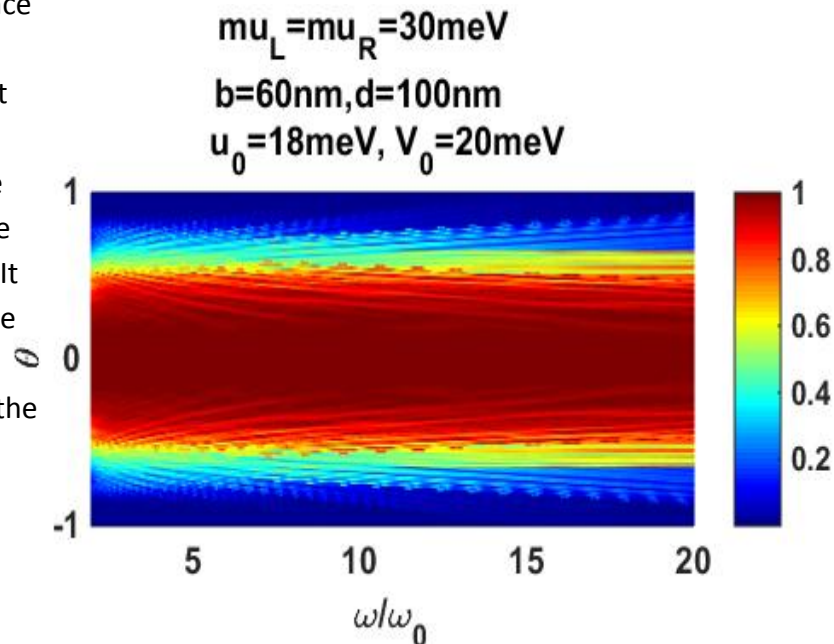


Fig2: Transmission as function of frequency of time dependent field and angle of incidence.