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Dirac cones in the gapless interface states between two topological insulators RYUJI TAKAHASHI, SHUICHI MURAKAMI, Department of Physics, Tokyo Institute of Technology — When two topological insulators are attached together, the states on the interface become gapped due to the hybridization between the surface states. We have shown that if the two topological insulators have the opposite signs for the Dirac velocities, there exist gapless interface states [1]. In the last March meeting we showed a general proof for the existence of the gapless states using the mirror Chern number, which fixes the chirality of the surface states. In this presentation, we report the dispersions of these gapless interface states. They are in general a collection of Dirac cones. For example, if the system has threefold rotational symmetry, the interface states have six Dirac cones. By using the Fu-Kane-Mele model, which is the tight-binding model on the diamond lattice with the spin-orbit interaction, we calculate the dispersion of this gapless interface states, and discuss the relationship with the mirror Chern number.

[1] R. Takahashi, S. Murakami, Phys. Rev. Lett. 107,166805 (2011).

Prefer Oral Session
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Ryuji Takahashi
r-takahashi@stat.phys.titech.ac.jp
Department of Physics, Tokyo Institute of Technology

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