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ARPES study of the surface states and their aging in a topological insulator, Bi_2Se_3 KALOBARAN MAITI, Tata Institute of Fundamental Research — Topological insulators possess time reversal symmetry protected metallic surface states over the insulating bulk, where these surface states are expected to be immune to weak disorder, chemical passivation of the surface or temperature change. However, significant discrepancy from such behavior has been found experimentally in various materials. We studied the detailed electronic structure and its aging of a topological insulator, Bi_2Se_3 employing high resolution photoemission spectroscopy. Both the band structure results and high resolution angle resolved photoemission data reveal significantly different surface electronic structure for different surface terminations. Furthermore, oxygen impurity on Se terminated surface exhibits an electron doping scenario, while oxygen on Bi terminated surface corresponds to a hole doping scenario. The intensity of the Dirac states reduces with aging indicating fragility of the topological order due to surface impurities. References

1. D. Biswas, S. Thakur, K. Ali, G. Balakrishnan,, and K. Maiti, Sci. Rep. (Nature) **5**, 10260 (2015).

2. D. Biswas and K. Maiti, EPL **110**, 17001 (2015).

3. D. Biswas, S. Thakur, G. Balakrishnan, and K. Maiti, Sci. Rep. (Nature) (2015) (to be published).

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