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Stepwise Quantized surface state and Hall plateaus in Co cluster decorated topological insulator BiSbTeSe2 SHUAI ZHANG, FENGQI SONG, Nanjing Univ — Topological surface state (TSS) of a three-dimensional (3D) topological insulator (TI) usually hosts special and intriguing transport phenomena. Compared with two-dimensional electron gas, Hall conductivities of a single TSS quantize to a half-integer quantum Hall (QH) state in a magnetic field. However, there are two TSS (top surface and bottom surface) of 3D TI, which usually leads to an integer QH effect. Here, we observe a stepwise quantization of the two TSSs by depositing Co clusters on the top surface of TI. The renormalization group flow was plotted, which exhibits a unique way to converge to the points of integer QH state. We can see the bottom surface is quantized earlier than the top surface, which with Co cluster decorating, with increasing the magnetic field from the flow. In higher magnetic field, more Hall plateaus are exhibited. Also, the Co clusters can induce to dissipative channels.

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