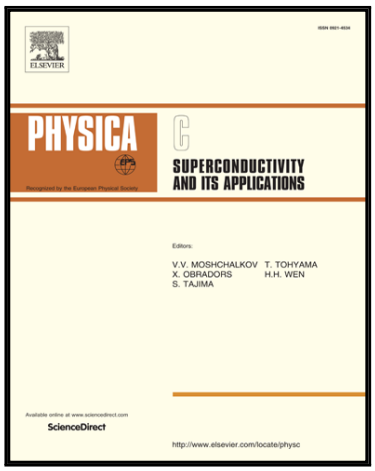

Pressure-induced reinforcement of interfacial superconductivity in a $Bi_2Te_3/Fe_{1+y}Te$ heterostructure

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Highlights

- At an atomically sharp boundary between the two non-superconducting materials FeTe and Bi_2Te_3 superconductivity of two-dimensional nature has been reported to occur in a thin layer at the interface. Both building blocks are non-superconducting materials. FeTe is a parent compound of the chalcogenide family of iron based superconductors, while Bi_2Te_3 is a well-known topological insulator. At low temperatures, it has been reported that the superconductivity spreads into the topological insulating layer and likely induces an unusual topological superconducting state. Neither the mechanism of the interfacial superconductivity nor the exact nature of the proximity-induced superconductivity in Bi_2Te_3 is known. Pressure experiments are considered as key test to clarify the phase diagram and to gain insights into the conventional or unconventional nature of superconductors, but to our knowledge have not yet been done on this heterostructure. In this paper we present electrical transport experiments under the influence of hydrostatic helium gas pressure. We show that the superconducting transition significantly sharpens while the transition temperature is increased. This shows that the interface has the potential for higher critical temperatures.