Abstract Submitted
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Studies on Bi/Ni bilayer superconductivity[1] SUNG PO CHAO, National Kaohsiung Normal University, Kaohsiung 82444, Taiwan, SHIUE-CHENG LU, JIN-HAN LIN, POK-MAN CHIU, WAN-JU LI, PENG-JEN CHEN, YUNG LIOU, TING-KUO LEE, Institute of Physics, Academia Sinica, Taipei 11529, Taiwan — Motivated by the recent observations[1] of possible p-wave in Bi/Ni bilayer, we study this system with similar growth methods. Due to higher temperature in the substrate during our sample growth compared with [1], we find clear evidences of forming alloys in both Bi/Ni and Ni/Bi bilayers, both showing superconductivity with maximal critical temperature around 4K. The critical temperature also has similar thickness dependence as seen in Ref.[1]. The formation of alloys indicates the Bi/Ni superconductivity found in our samples could be of phonon mediated type II superconductivity. Further point contact Andreev reflection measurements or other surface probes are needed to see if we could also observe the p-wave like signature in our samples as in Ref.[1]. From the theory side, we propose a simple model, similar to the proximity induced p-wave by Sau et al.[2], to explain why in our sample the p-wave like Andreev signals is likely to be observed, assuming the strong spin-orbit coupled surface states of Bi thin film are not completely destroyed by the formation of alloys.

References:

Gong Xin-Xin et al , Chinese Phys. Lett. 32 067402 (2015).

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Sung Po Chao
National Kaohsiung Normal University, Kaohsiung 82444, Taiwan

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