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Strain measurement in the interface between crystalline Silicon and amorphous Silicon with MEIS

Yongho Ha, Sehun Kim, *H.K. Kim, *D.W. Moon
Department of Chemistry, KAIST, *Surface analysis group, KRISS

Low temperature Si epitaxy can provide flexibility for a device designer to tailor or optimize the device performance. It is better method for controlling the doping thickness, concentration and profile than ion implantation and diffusion. But there is a limited growth thickness in this method. At a given temperature, the film grows epitaxially for a certain limiting thickness(h_{epi}) and becomes amorphous. The transition from crystalline Si to amorphous Si is abrupt[1].

In this study, Si film was deposited by ion beam sputter deposition on Si(001) above a limiting thickness and measure the strain in the interface between crystalline Si and amorphous Si. The strain was compressive and the maximum value was about 2%.

[Reference]

1. D. J. Eaglesham, J. Appl. Phys. 77 (8), 3597 (1995)