

Morphology of Ag(100) thin films on Fe/GaAs(100) substrates: the influence of film thickness and annealing processes studied by scanning tunneling microscopy

J. Lösch, P. Leinenbach, U. Memmert, U. Hartmann

Epitaxial Ag(100) thin films were prepared on Fe/GaAs(100) by room temperature deposition. The films were examined by scanning tunneling microscopy (STM) before and after an annealing procedure at 500-600 K. The as-grown films display percolating grains with channels, reaching down to the substrate in-between the grains for 15 nm films, and a number of remaining holes for 75 nm films. The annealing process leads to remarkable changes of the film morphology. For 15 nm films the Ag agglomerates into a few grains, up to 100 nm high. Films of more than 50 nm thickness are converted into completely closed layers with a low surface roughness. The surfaces of these films still show a number of structural defects, which are mainly screw dislocations.