Nanostructures of Si/SiO_2/metal with swift heavy ion tracks for sensorics applications

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By means of the swift heavy ion track technology, which includes irradiation by $^{197}Au^{+26}$ ions (energy 350 MeV, fluence 10^8 cm^{-2}), chemical etching of ion tracks and underpotential electrochemical deposition [1], structures on the base of SiO_2/n-Si with nanopores in silicon dioxide layers, filled with Cu and Ni nanoparticles, have been prepared and investigated. Selectivity of nanopores filling with metals and cluster character of their formation in the tracks have been shown using SEM and AFM techniques (Fig.1). Investigations of current-voltage dependences of the obtained structures have shown their exploitability for a creation of novel magnetic field sensors.

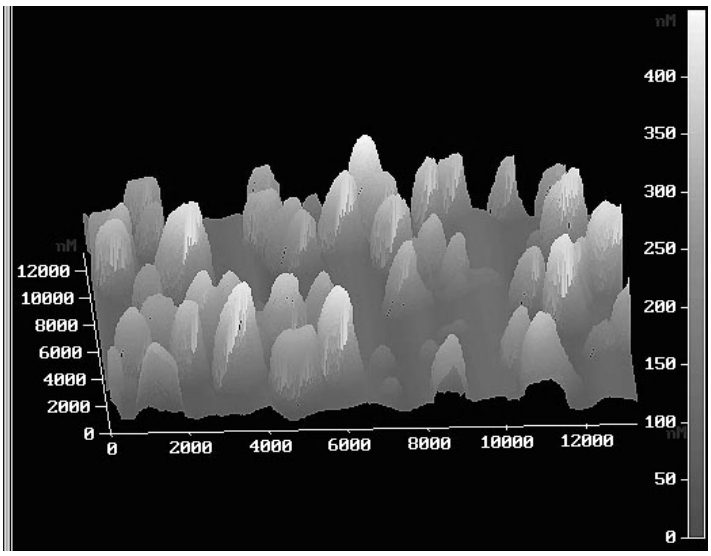

Figure 1: Isometrical image of SiO_2 layer with etched swift heavy ion tracks, filled with Cu

[1] Fundamentals of Ion-Irradiated Polymers. Ed. by D.Fink. Heidelberg. Springer Series in Materials Science. V.63. 2004