

The thesis deals with analysis of fluctuations of the tunnelling current in scanning tunnelling microscopy (STM). The dynamics of Sn atoms on the surface Si (111)  $7\times 7$  is studied by means of time records of the tunnelling current. The records provided characteristic times of Sn adatom staying in various areas of half unit cells of the surface reconstructions are analysed. The model types of the tunnelling current interference, which influence the measurement accuracy, are also studied.