Transport Properties of Ultrathin Interfaces Based on Al/AlOx/Al

Miroslava Dešková, Peter Bokes

miroslava.dieskova@gmail.com

We study transport properties of the ultrathin AlOx interfaces between aluminum electrodes. We employ combination of the Landauer formulation of the electronic transport within the framework of the maximally localized Wannier functions, implemented in the computational package WanT. Furthermore, the knowledge of Wannier functions allows direct connection between electronic transport properties and the nature of chemical bonds. We characterise two different geometrical and chemical arrangements of the oxide interface with different local electronic structure and hence with different transmission spectra. Our results indicate how transport measurements can complement experimental structural studies of these technologically important interfaces.