THE HEAT TRANSFER IN NANOSCALE

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Abstract

The thermal properties of surface of solid materials are widely studied by using of scanning thermal microscopy (SThM). This technique is based on the transfer of heat between the hot tip of SthM probe and sample surface. The measurements are performed at ambient temperature and pressure. Therefore, we must considered about dissipation of heat trough the air. Moreover, the tip-sample contact is different during mapping of sample that leads to deterioration of thermal sensitivity, resolution, quantitative measurement etc. In recent years many papers deal with the heat flux across the tip-sample contact. One of the approach used the molecular dynamics (MD) method for the predict of thermal characteristic of samples, such as specific heat, heat diffusion or flux. On the basic of this prediction we can explain the thermal map measured by SthM. In this contribution, MD software approaches to study heat transfer phenomena at probe sample region will be discussed.

Keywords: Scanning thermal microscopy, molecular dynamics, nanoscale, heat transfer

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