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S E M I N A R
aus
Halbleiterphysik und Nanotechnologie

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"Electrode engineering of organic thin film transistors by self-assembled monolayers"

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Advanced organic electronic devices require fast and reliable organic transistors. The switching speed of an organic transistor depends on key issues as miniaturization and low contact resistance.

The contact resistance between organic semiconductor and metal electrode originates from a mismatch of work functions. This mismatch can be reduced significantly by binding a tailored self-assembled monolayer (SAM) on the metal surface. This concept provides organic transistors with contact resistances below 1 kΩ cm and improved mobility, transfer frequency and source/drain current.

The high potential of engineering the properties of a metal/semiconductor interface by SAMs with embedded dipoles is shown for p-type (pentacene) and n-type (C_{60}) organic transistors, as well as for 2D-semiconductor applications using MoS_2 single crystals.