Electrically Detected Magnetic Resonance

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Magnetic resonance techniques have attracted considerable attention in many research fields, and are commonly used, as for example in medical imaging. Advantages compared to other techniques are among others, high sensitivity and selectivity. In general, the technique can be used to investigate local static and dynamic interactions, or in other words the microscopic surroundings of the spin. In this work we will give an introduction to Electrically Detected Magnetic Resonance applied to organic devices. EDMR was observed since 1966, but has gained a new impulse in recent years as one of the few Electronic Magnetic Resonance (EMR) spectroscopy applicable to Nanoscience and Nanotechnology [1]. Typically, in an EDMR experiment spin level transitions induced by magnetic resonance are measured through changes in device current. The key to EDMR is that many of the processes that lead to charge transport and recombination in semiconductors are strongly dependent on spin selection rules, or the spin states of interacting electrons. Examples of EDMR use will be presented on the study of state-of-the-art organic devices, Organic Light Emitting Devices as well as unipolar devices.

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