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## Studying the dynamics of PTB7:PCBM blend films with quasielastic neutron scattering

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In organic photovoltaics, donor - acceptor bulk heterojunctions are often used as active layer due to their superior performance compared to e.g. planar structured devices. In this optically active polymer layer, a photon is absorbed and an exciton created. After diffusion to a donor-acceptor interface, the exciton is dissipated and charge carriers can be extracted at the electrodes.

A frequently applied and well-studied system is the combination of P3HT ((C<sub>10</sub>H<sub>14</sub>S)<sub>n</sub>) as electron donor and PCBM (C<sub>72</sub>H<sub>14</sub>O<sub>2</sub>) as electron acceptor. Previous studies have shown that internal dynamics and structural layout of the active layer influence its electronic properties and thus its performance in a device.

A more modern, very promising low-band gap electron donor material is PTB7 ((C<sub>41</sub>H<sub>53</sub>FO<sub>4</sub>S<sub>4</sub>)<sub>n</sub>). We investigated films of PTB7, PCBM and a mixture of these two, prepared out of chlorobenzene solutions. On these films we performed first quasielastic neutron scattering experiments at the cold neutron time of flight spectrometer TOFTOF (MLZ, Garching). Hydrogen dynamics of pure compounds as well as blend films are investigated on a pico- to nanosecond timescale in a temperature range from 150 K to 400 K. Results are compared with the established P3HT:PCBM system.

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