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Switching or triggering by light organic materials in the 100 nm size range VINA FARAMARZI, JEAN FRANCOIS DAYEN, BERNARD DOUDIN, IPCMS/CNRS/UDS, DMONS TEAM — We investigate optoelectronic fabrication and characterization of organic electronics devices in the 100 nm range. This intermediate size has advantages in simplicity of device fabrication and robustness of observed properties. For this aim high aspect ratio lateral electrodes separated by a sub 100nm gap were produced by means of simple optical lithography techniques [1]. The electrical measurements set-up is integrated with an inverted optical microscope, allowing simultaneous optical and electrical measurements followed by temperature and magnetic field studies. We demonstrate that electrical contacts are suitable for a wide range of current measurements going from 10^{-13} to 10^{-2} A. This versatility makes the nanotrench design compatible for studying a broad variety of nanoparticles and molecular systems. Electrical transport properties of different devices are presented, e.g molecular switches, Iron based spin-transition nanoparticles, Conductive molecular chains and 2D nanoparticle networks. The promising reproducible results reveal novel intrinsic transport properties and confirm the high interest and reliability of this approach for further studies in the field of molecular electronics and spin dependent transport in molecular structures.
[1] J-F Dayen, V Faramarzi et al, *Nanotechnology* **21**(33), 335303 (2010)

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