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Photocontrolled spin polarization at hybrid organic-ferromagnetic interfaces[1] YAN WANG, HAI-PING CHENG, Dept. of Physics and Quantum Theory Project, University of Florida — We report a first-principles study of magnetic properties at an organic-ferromagnetic interface by placing light-switchable azobenzene molecules on a Fe/W(110) surface. Our calculations clearly demonstrate that the magnetic properties of the hybrid interface, such as the local magnetic moment and spin polarization, change significantly as the azobenzene molecule switches reversibly from the trans to the cis form. The molecule-surface interaction, which determines the feasibility of photo-switching of the azobenzene on the surface, can be altered by chemical functionalization of the molecule. Specifically, we find that substitution of the H atoms with electronegative F atoms substantially reduces the binding energies of the molecule on the Fe surface. This study suggests a new way to manipulate magnetism by application of light at organic-ferromagnetic hybrid interfaces.

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Yan Wang
Dept. of Physics and Quantum Theory Project, University of Florida

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