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Organic semiconductor interfaces: low-lying lattice modes of pentacene monolayers[1] RUI HE, Columbia Univ, GRACIELA BLANCHET, Nanoterra, Cambridge, MA, ARON PINCZUK, Columbia Univ — Highly uniform monolayers of pentacene that are grown on polymeric substrate of poly alpha-methylstyrene exhibit sharp and intense free exciton luminescence. Large enhancements of Raman scattering intensities at the free exciton resonance enable the first observations of low-lying lattice vibration modes in films reaching the single monolayer level.[2] The low- lying modes display characteristic changes when going from a single monolayer to two layers, revealing that a phase akin to a thin film phase of pentacene already emerges in structures of only two monolayers. A simple analysis of mode splittings offers estimates of the strength of inter-layer interactions. The results demonstrate novel venues for ultra-thin film characterization and studies of interface effects in organic molecular semiconductor structures.

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[2]Rui He, et al. Appl. Phys. Lett. 94, 223310 (2009).

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