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Magnetic properties of ultracold fermions in multilayered Lieb lattices KAZUTO NODA, KENSUKE INABA, MAKOTO YAMASHITA, NTT Basic Research Laboratories and JST-CREST — The recent experimental development in atomic physics enables us to realize novel many-body systems using optical lattices. We study the magnetic properties of cold fermions in multilayered Lieb lattices, which are the ideal model systems for investigating the flat-band ferromagnetism. Our dynamical mean-field results of bilayer, trilayer, and several multilayers elucidate that finite magnetization at the surface layers in the odd-layered lattices emerges even in the infinitesimal small interaction region. This is a striking feature of the flat-band ferromagnetism in multilayered systems as a consequence of the Lieb theorem. We also discuss how this phenomenon appears in the infinite-layered (three dimensional) system.

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