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Fabrication of artificial heavy fermion superlattices by the molecular beam epitaxy HIROAKI SHISHIDO, TOMONARI KATO, MANABU IZAKI, TAKASADA SHIBAUCHI, YUJI MATSUDA, Department of Physics, Kyoto University, Kyoto 606-8502, Japan, TAKAHITO TERASHIMA, Research Center for Low Temperature and Materials Sciences, Kyoto University, Kyoto 611-0011, Japan — We have grown artificial superlattices of CeIn_3 (m) / LaIn_3 (n), in which m -layers of heavy-fermion antiferromagnet CeIn_3 and n -layers of a non-magnetic isostructural compound LaIn_3 are stacked alternately, by a molecular beam epitaxy. Growth process were monitored by reflection high energy electron diffraction (RHEED). Sharp streak pattern of RHEED indicates the epitaxial growth of thin films. Satellite peaks observed in a X-ray diffraction pattern also indicates the superlattice structure. By reducing the thickness of CeIn_3 , we observe a suppression of antiferromagnetic order and an enhancement of effective mass inferred from the resistivity coefficient, which both imply new ‘dimensional tuning’ towards a quantum critical point.

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