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Extremely strong-coupling superconductivity in artificial two-dimensional Kondo lattices YUTA MIZUKAMI, Department of Physics, Kyoto University, HIROAKI SHISHIDO, Research Center for Low Temperature and Materials Sciences, Kyoto University, TAKASADA SHIBAUCHI, MASAAKI SHIMOZAWA, SATOSHI YASUMOTO, DAIKI WATANABE, MINORU YAMASHITA, HIROAKI IKEDA, Department of Physics, Kyoto University, TAKAHITO TERASHIMA, Research Center for Low Temperature and Materials Sciences, Kyoto University, HIROSHI KONTANI, Department of Physics, Nagoya University, YUJI MATSUDA, Department of Physics, Kyoto University — Superconductivity with the strongest electron correlations is realized in heavy-fermion system, where almost all of the compounds have three-dimensional nature. It had remained an unanswered question whether superconductivity would persist on reducing the dimensionality of these materials. We succeeded in observing superconductivity in the system of heavy electrons confined within a two dimensional square lattice of Ce atoms, which was realized by fabricating epitaxial superlattices built of alternating layers of heavy-fermion $CeCoIn_5$ and conventional metal $YbCoIn_5$[1]. The field-temperature phase diagram of the superlattices exhibits a striking enhancement of the upper critical field relative to the transition temperature. This implies that the force holding together the superconducting electron pairs takes on an extremely strong-coupled nature as a result of two-dimensionalization. [1]Mizukami *et al.*, Nature Phys. **7**, 849 (2011).

Yuta Mizukami
Department of Physics, Kyoto University

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