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Atom-dimer scattering in an ultracold three-component mixture of ^{6}Li SHUTA NAKAJIMA, The University of Tokyo, MUNEKAZU HORIKOSHI, Japan Science and Technology Agency, MASAHITO UEDA, The University of Tokyo and Japan Science and Technology Agency, TAKASHI MUKAIYAMA, The University of Electro-Communications and Japan Science and Technology Agency
— Recently, an unexpected magnetic-field dependence of atomic loss was discovered in a mixture of three lowest-lying hyperfine states (|1>= |F=1/2, m_F=1/2>, |2>= |F=1/2, m_F=-1/2> and |3>= |F=3/2, m_F=-3/2>) of ^{6}Li atoms. Since the first report of this loss feature, there has been an increasing interest in the loss mechanism in the context of trimer formation. We are interested in confirming the existence of the three-body bound state (Efimov trimer) and investigating mixtures of atoms in |1> and dimers of |2> $-$|3> to treat the three-component system as "two component" system. We prepared balanced mixtures of the atoms in |1> and the dimers of |2> $-$|3> by using adiabatic rapid passages and magnetic field sweeping. To measure the magnetic-field dependence of the atom-dimer loss rate, we held the mixture at various magnetic fields and recorded the remaining fraction of atoms in |1>. We found two atom-dimer loss peaks at 605 G and 685 G. Because the lower peak is expected to be due to a "ground-state" Efimov trimer, our finding provides the first experimental evidence for the "ground-state" Efimov trimer in the three-component mixture of ^{6}Li.

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