



Discovery of two L & T binaries with wide separations and peculiar photometric properties

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We present spatially resolved photometric and spectroscopic observations of two wide brown dwarf binaries uncovered by the SIMP near-infrared proper motion survey. The first pair (SIMP J1619275+031350AB) has a separation of 0.691" (15.2 AU) and components T2.5+T4.0, at the cooler end of the ill-understood J-band brightening. The system is unusual in that the earlier-type primary is bluer in J-Ks than the later-type secondary, whereas the reverse is expected for binaries in the late-L to T dwarf range. This remarkable color reversal can possibly be explained by very different cloud properties between the two components. The second pair (SIMP J1501530-013506AB) consists of an L4.5+L5.5 (separation 0.96", 30-47 AU) with a surprisingly large flux ratio ($\Delta J = 1.79$ mag) considering the similar spectral types of its components. The large flux ratio could be explained if the primary is itself an equal-luminosity binary, which would make it one of the first known triple brown dwarf systems. Adaptive optics observations could not confirm this hypothesis, but it remains a likely one, which may be verified by high-resolution near-infrared spectroscopy. These two systems add to the handful of known brown dwarf binaries amenable to resolved spectroscopy without the aid of adaptive optics and constitute prime targets to test brown dwarf atmosphere models.

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