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チャンドラ衛星による褐色矮星 TWA 5B の高空間分解能 X 線観測

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We present an X-ray detection of a brown dwarf companion TWA 5B around a pre-main sequence spectroscopic binary TWA 5A (= CoD -33°7795A), which is a member of the TW Hya association of T Tauri stars at ~ 55 pc. Apart from the primary source by $2''$, the faint companion is clearly resolved in our *Chandra* image, although the counts (35 counts) were 10 times less than those of TWA 5A (300 counts). The spectrum of TWA 5B was characterized by cool temperature of only 0.3 keV. The X-ray luminosity was 4×10^{27} erg s $^{-1}$ (0.1–10 keV band). Since this source is the first X-ray sample for middle age brown dwarfs, compiling the data of young and old brown dwarfs, we obtained an evolutionary track of X-rays from brown dwarfs; before the age of 10 Myr, saturation limit of L_X/L_{bol} is almost constant at the level of 10^{-3} – 10^{-4} , and it decays after the age of 10 Myr to 10^{-5} , while plasma temperature decays before the age of 10 Myr. These changing are very similar to the evolution of solar-mass young stellar objects, then we conclude that X-ray emission mechanisms among them are common. Since this BD is nearly at the boundary between BDs and planet, even planets might emit strong X-rays if they are young.