X-ray Flare from an Old Brown Dwarf

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Abstract

An X-ray flare from the brown dwarf LP 944-20 is described. This observation is distinguished from earlier X-ray detections of brown dwarfs by two facts: (1) the detection is of a flare (approximately 90 min in duration), and not of persistent emission, indicating strong magnetic activity, and (2) this object is 500 Myr old and therefore fully collapsed, while previous detections were of young objects (<10 Myr) and may be powered by accretion collapse, such as in T Tauri stars. The idea that an unusual process is taking place is further reinforced by the later detection with the VLA (by Berger et al) of strong radio flares – up to a factor 10,000 stronger than expected from the radio/X-ray correlation from active stellar coronae by Guedel and Benz. Either this object is unusual to itself, or there is an unexpected physical process which dominates coronal emission at the end of the main sequence.

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