Looking for stellar activity in brown dwarfs

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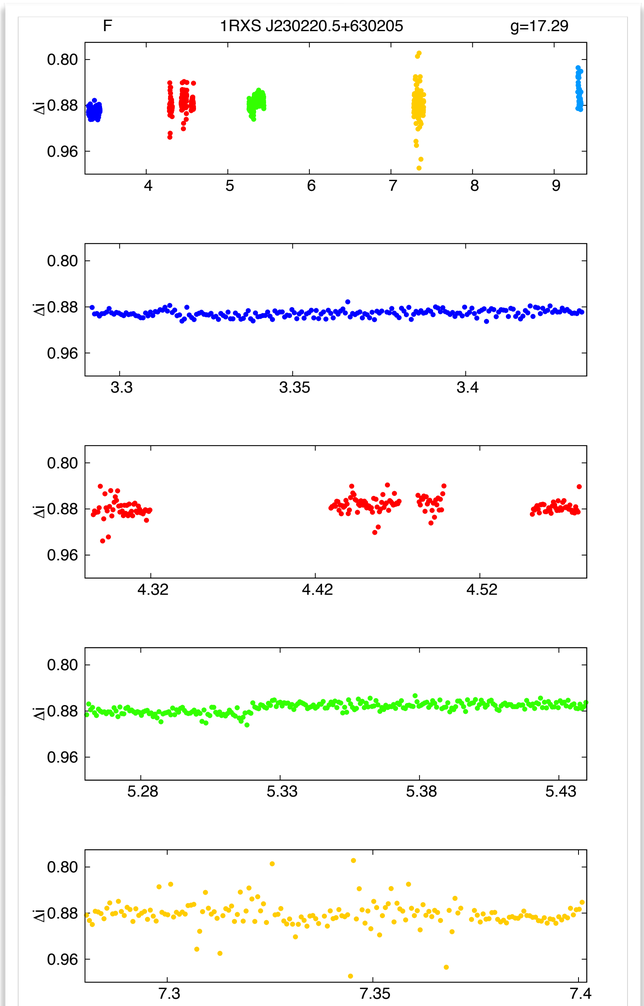
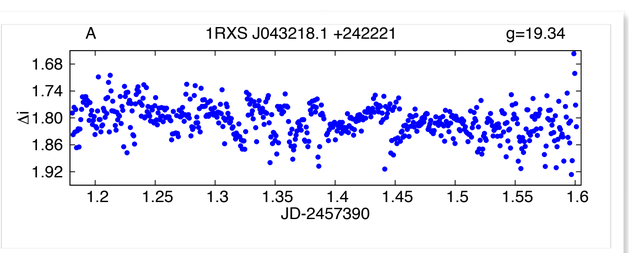
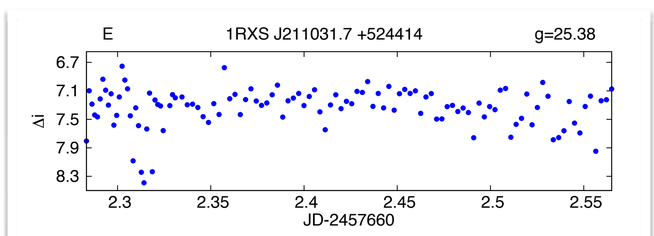
Currently the number of known magnetically active brown dwarfs is rather small. Here we present photometric measurements of a new sample of ultracool objects in order to find photometric changes that could indicate magnetic activity.

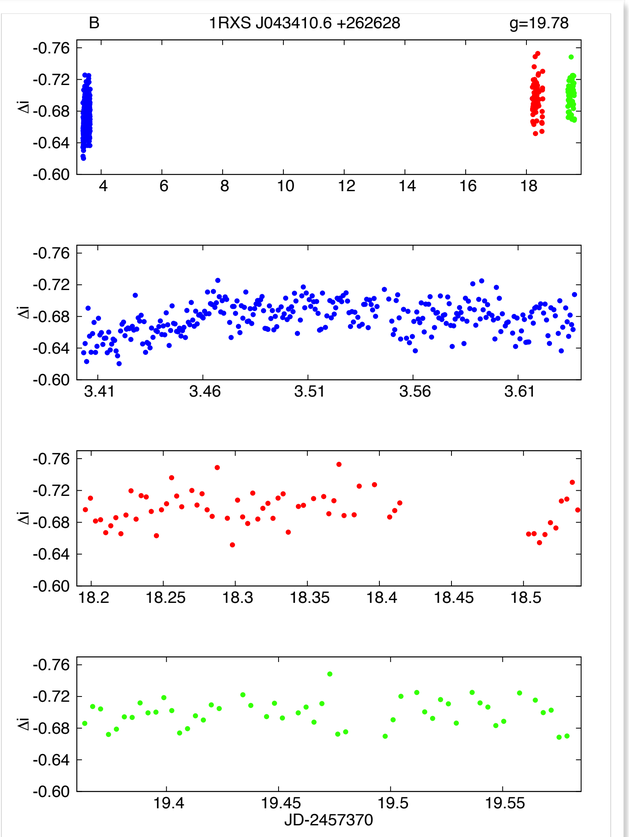
The targets for this small survey were selected using the SDSS database. We searched for relatively bright (i=15–20 mag) M–L type stars that were also categorized as X-ray sources in the ROSAT catalogue. The spectral types were determined using color indices (based on Cruz et al. 2003 AJ, 126, 2421). By visual inspection of the surroundings of the possible targets we narrowed our target list for 6 objects to exclude e.g. blending stars.

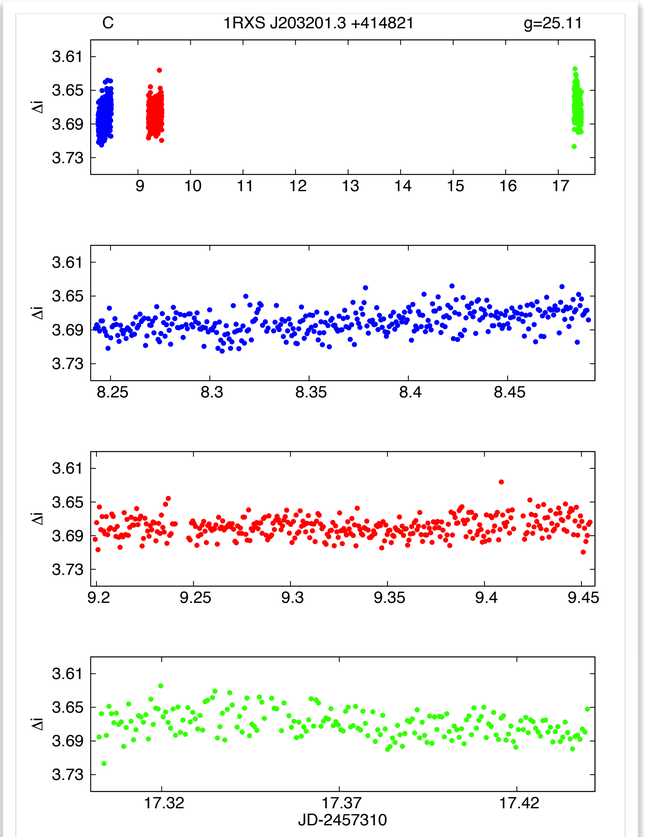
Our targets were observed by the 1m RCC telescope of the Konkoly Observatory at Piszkéstető in Sloan i filter. The purpose of this study was to identify photometric variations caused by activity e.g. spottedness or flares. Unfortunately, the selected targets did not show any obvious signs of stellar magnetism. However, in some cases variations in the light curves were determined, which have to be confirmed by further observations.

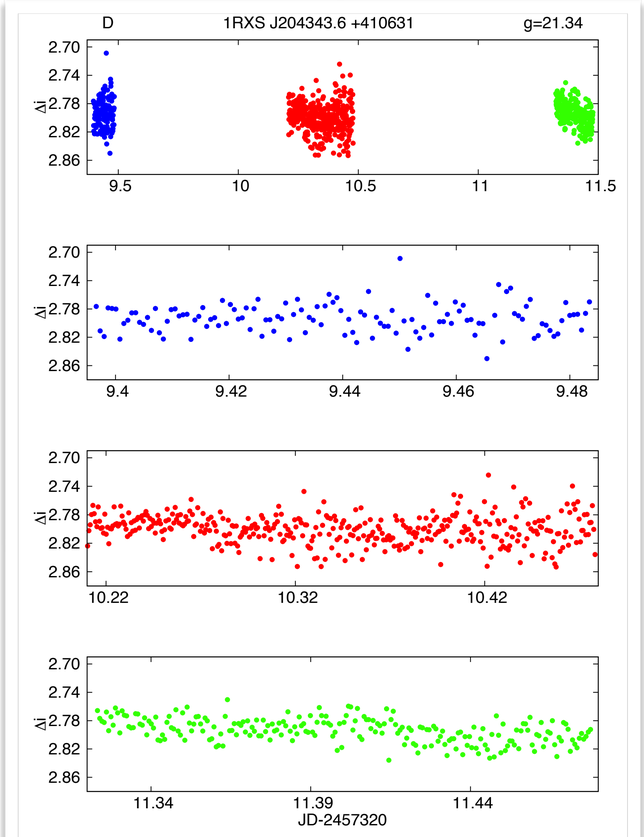












Summary of the targets and observations

	RA	Dec	*u*	*g*	*r*	*i*	*z*	*J*	*H*	*K*	ROSAT source type	# of nights observed	t_{exp} [h]
A	**04:32:17**	**24:22:14**	21.66	19.34	17.55	15.12	13.66	11.54	10.79	10.38	faint	1	9.8
B	**04:34:11**	**26:26:18**	22.69	19.78	17.38	15.90	14.81	12.44	11.21	10.73	faint	3	17.1
C	**20:32:00**	**41:48:38**	24.14	25.11	24.80	16.44	15.19	12.69	11.42	10.94	faint	3	15.2
D	**20:43:43**	**41:06:24**	23.89	21.34	18.23	16.54	15.18	12.63	11.30	10.82	faint	3	12.2
E	**21:10:30**	**52:44:08**	23.58	25.38	22.30	19.17	17.03	13.57	11.67	10.95	faint	1	3.3
F	**23:02:20**	**63:02:08**	20.68	17.29	15.47	14.55	13.88	12.19	11.34	11.06	bright	5	15.4

Acknowledgements

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