Detecting contaminating eclipsing binaries (CEBs) with the Corot colors

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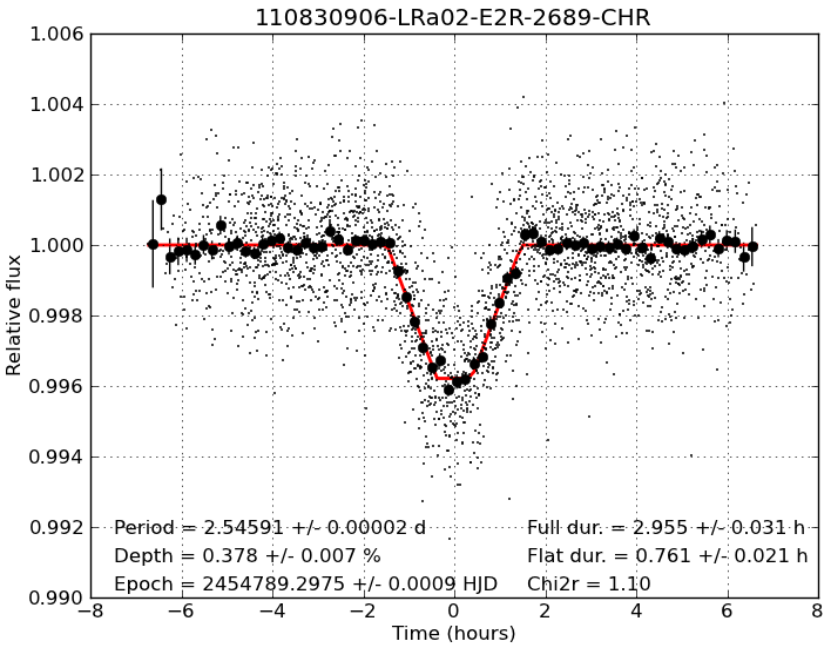
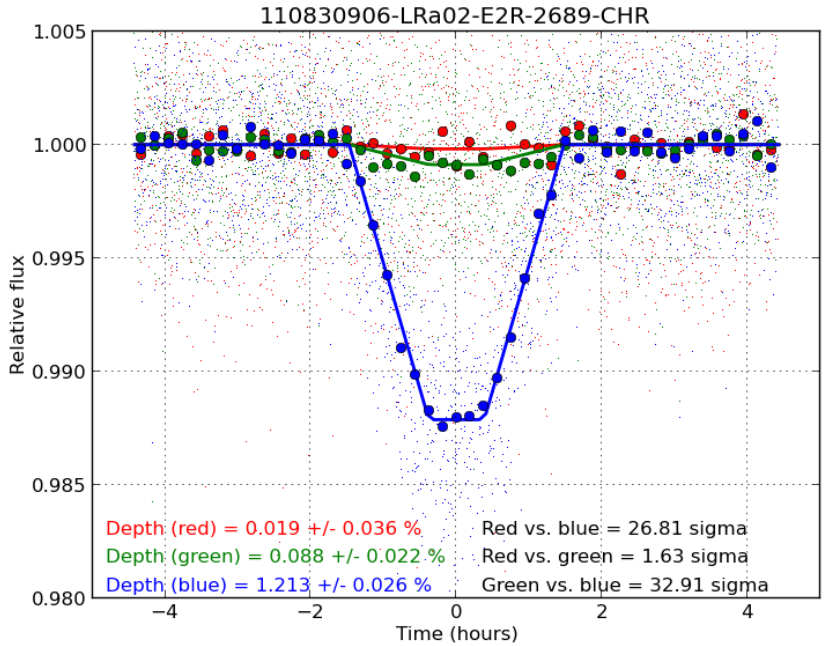
Corot SC meeting #44 – Obs. Paris

3 July 2012

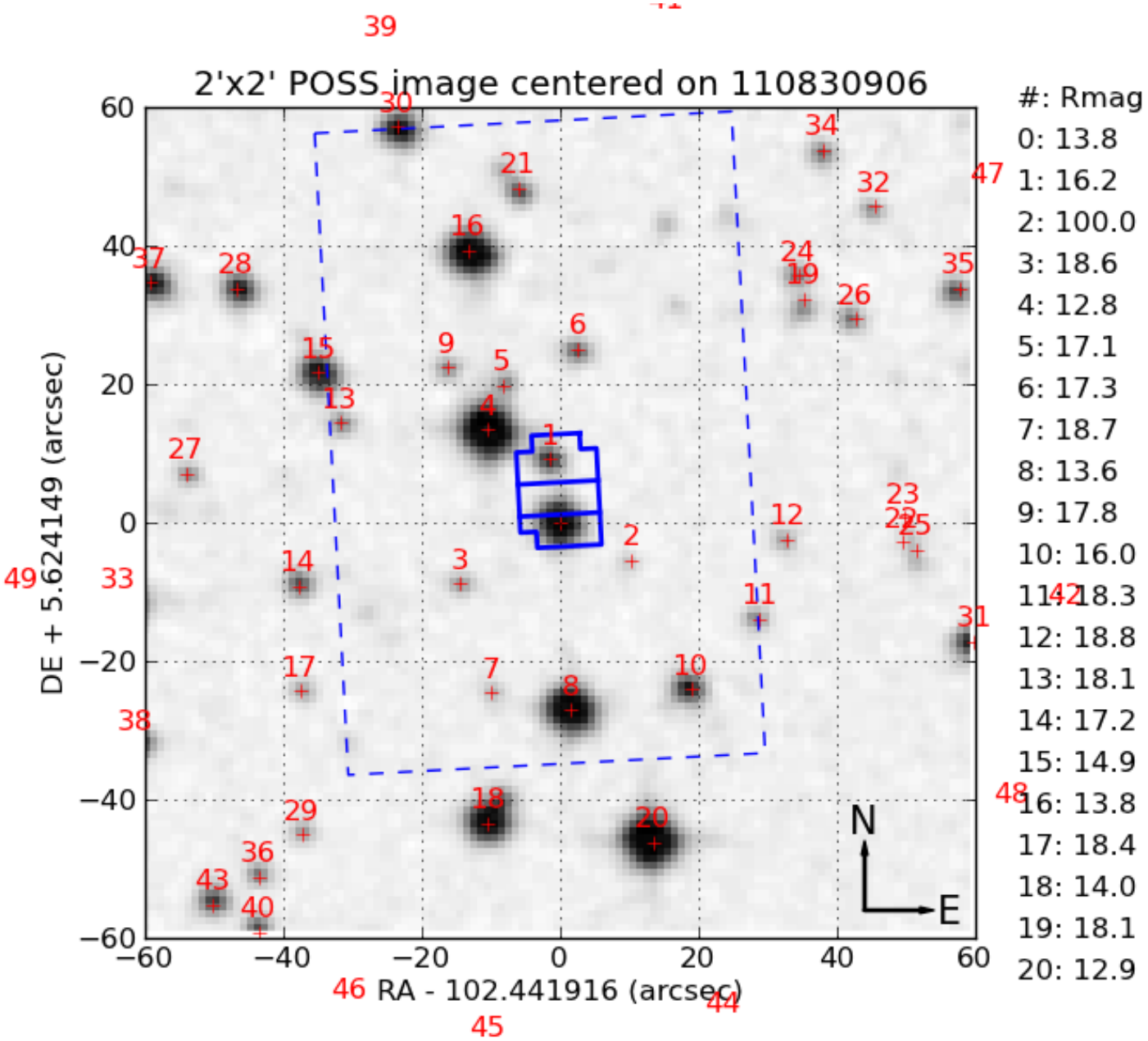
LRa02-E2R-2689-CHR transit light curves

Computed photocenter shift: 0.006 pixel (Tingley & Deeg 2012)

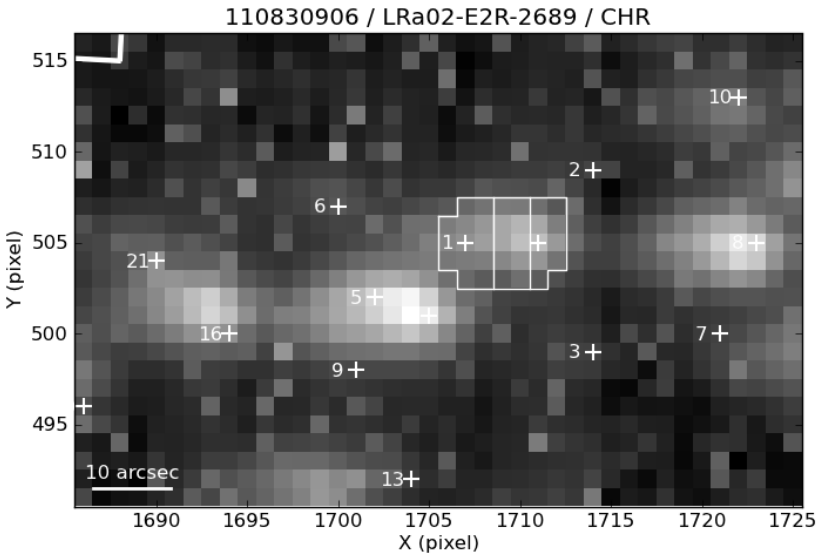


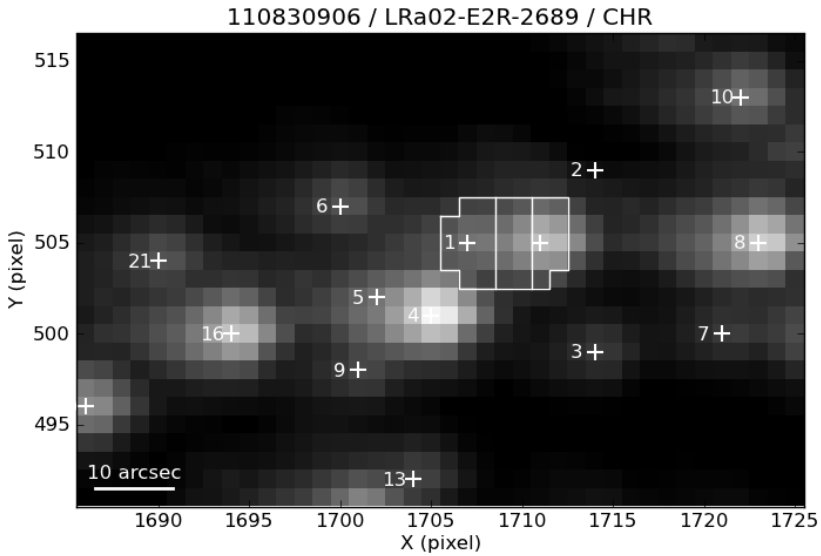


The Palomar view of LRa02-E2R-2689-CHR with PPMXL

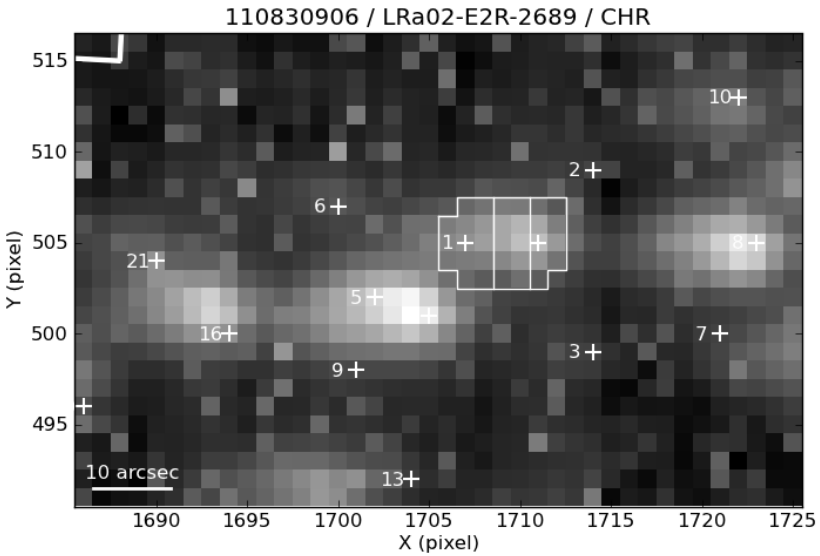


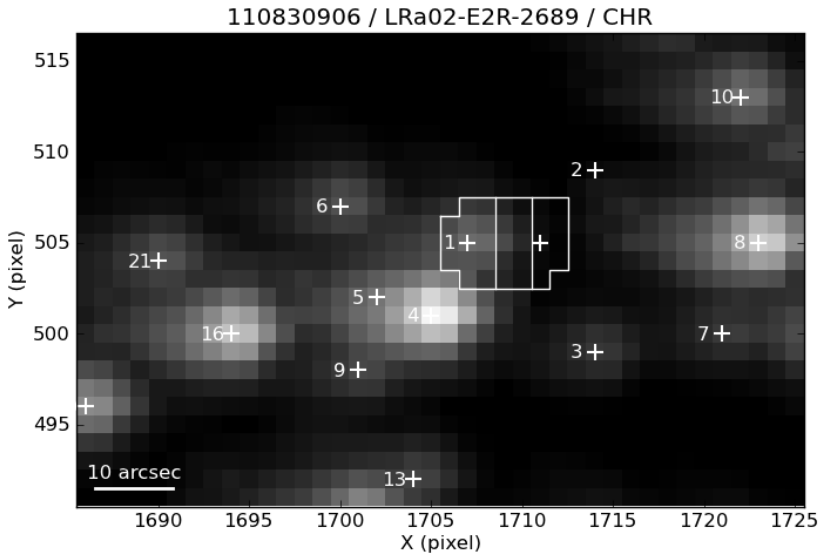
The Corot view of LRa02-E2R-2689-CHR





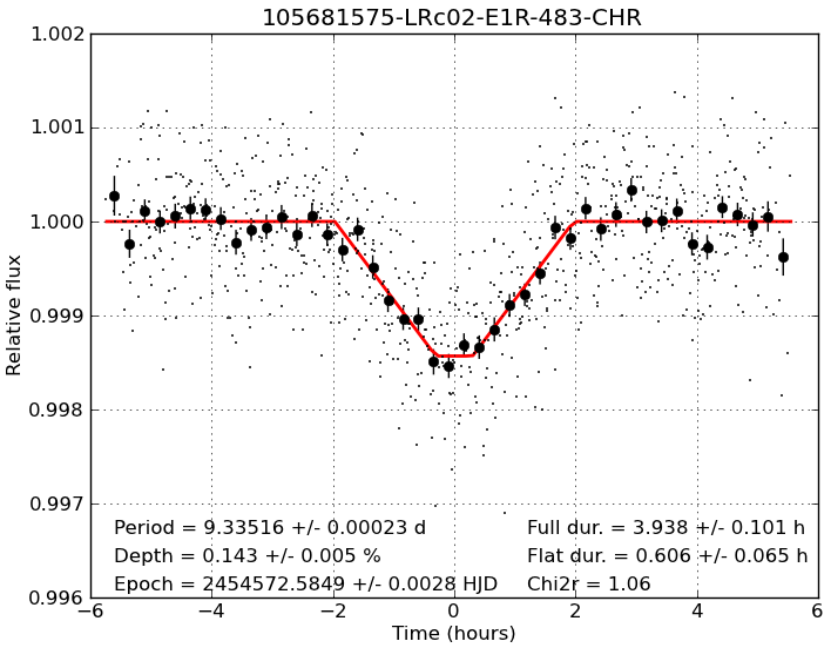
The Corot view of LRa02-E2R-2689-CHR

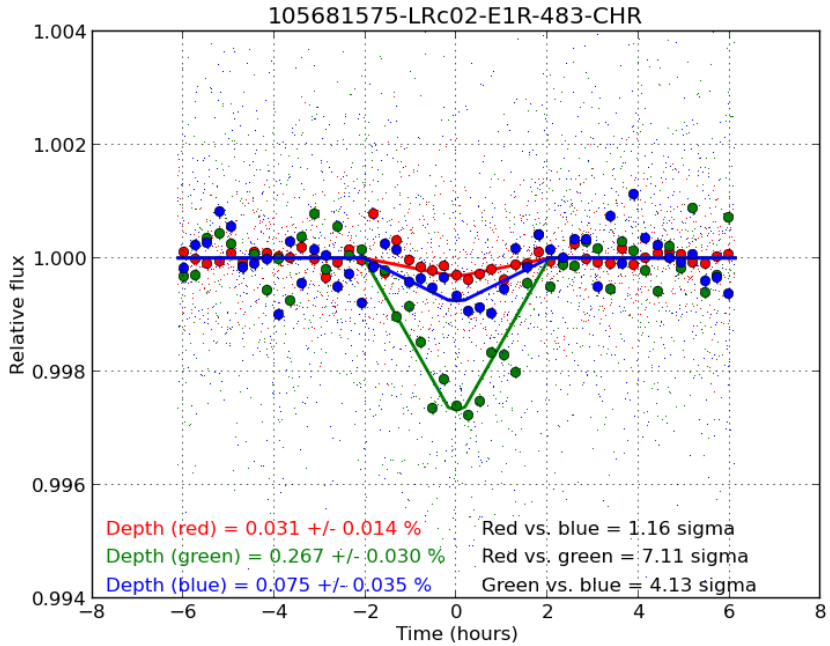




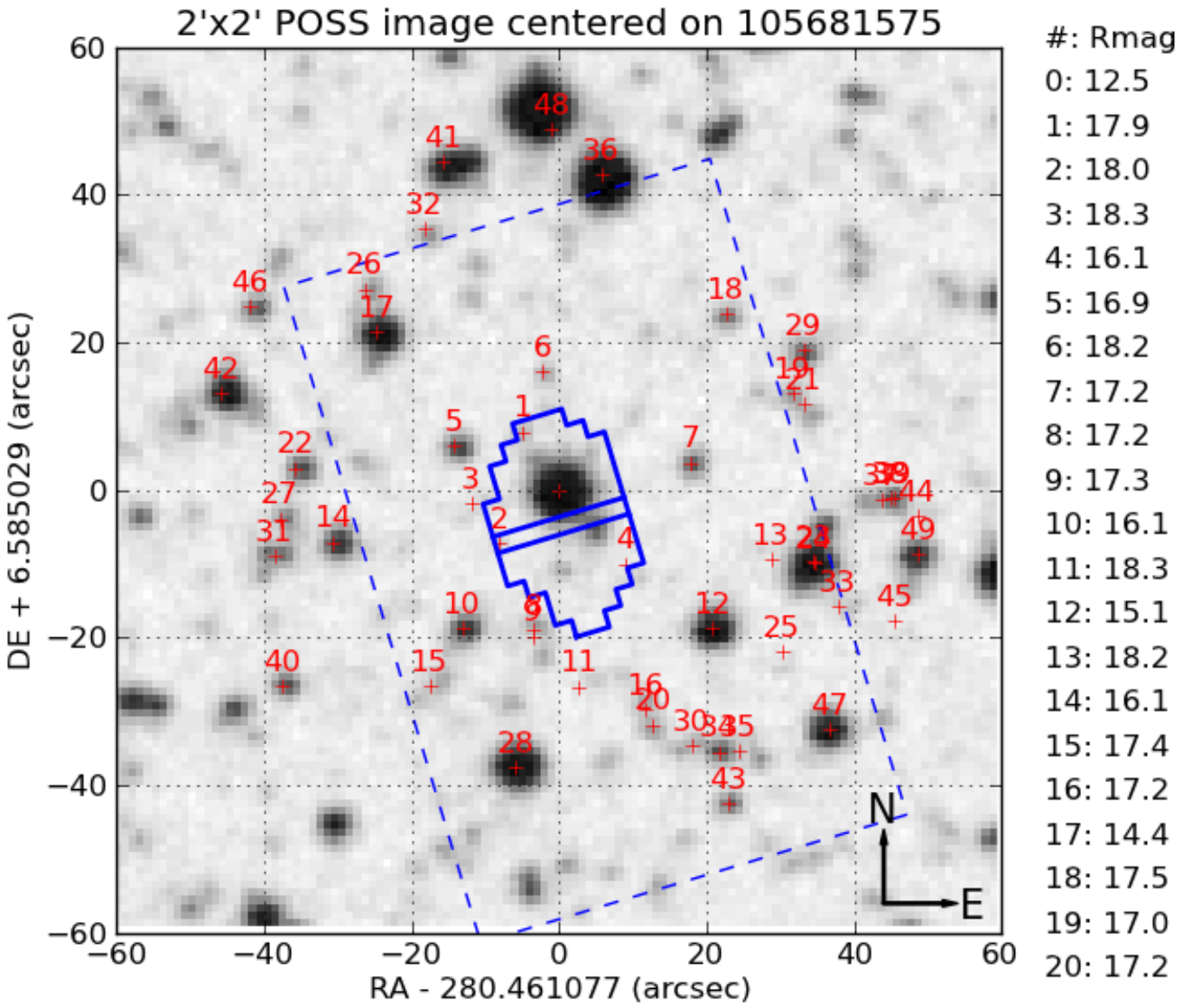
LRc02-E1R-483-CHR transit light curves

Computed photocenter shift: 0.003 pixel (Tingley & Deeg 2012)

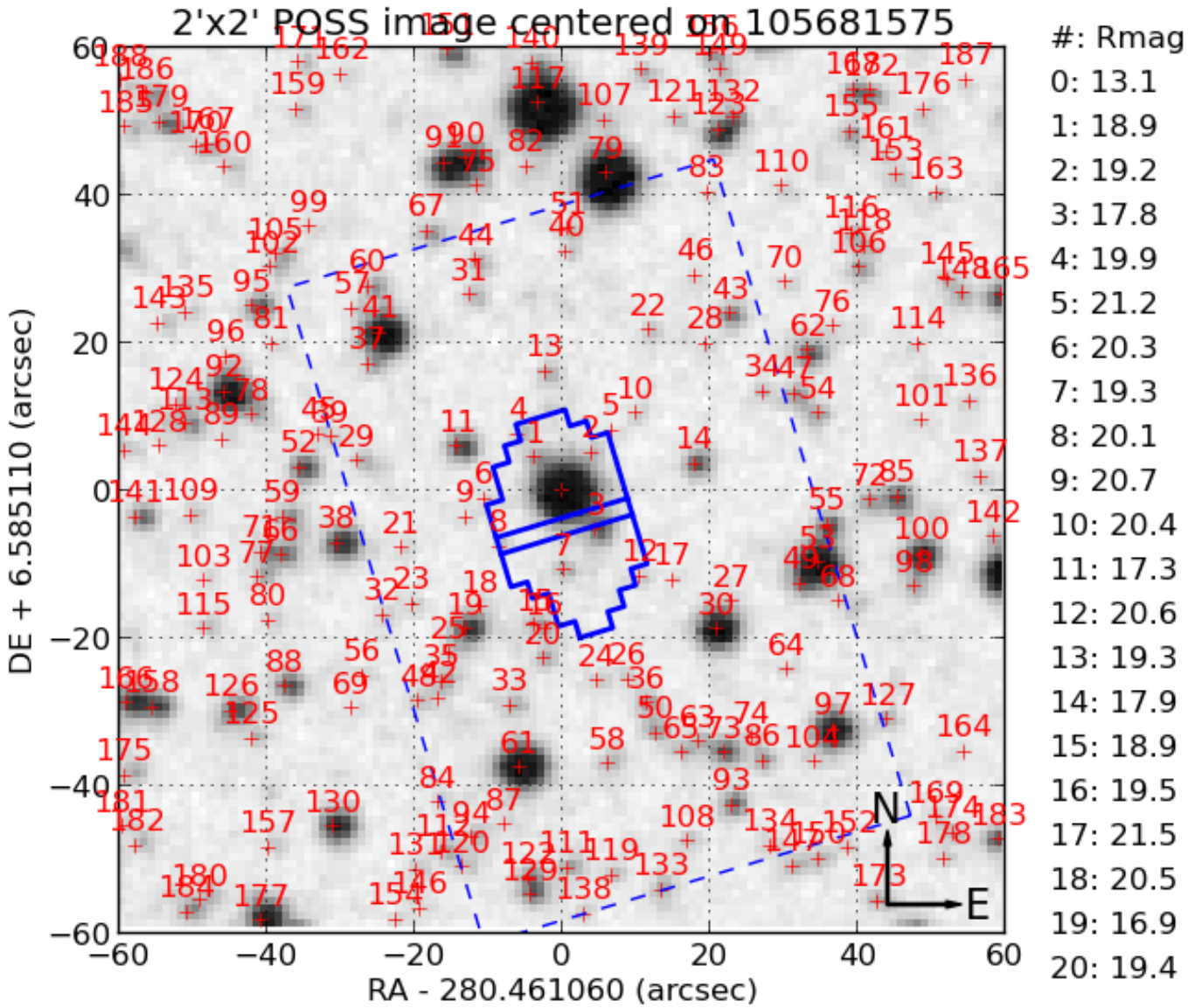




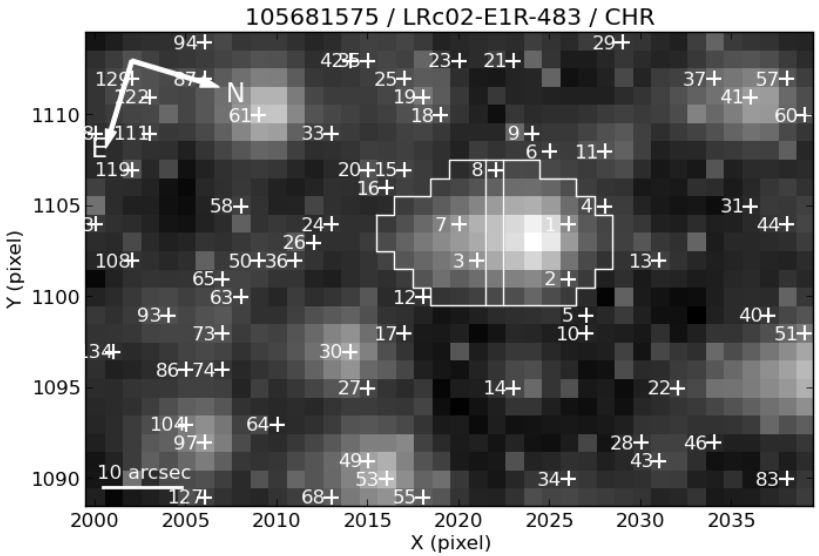
The Palomar view of LRc02-E1R-483-CHR with PPMXL

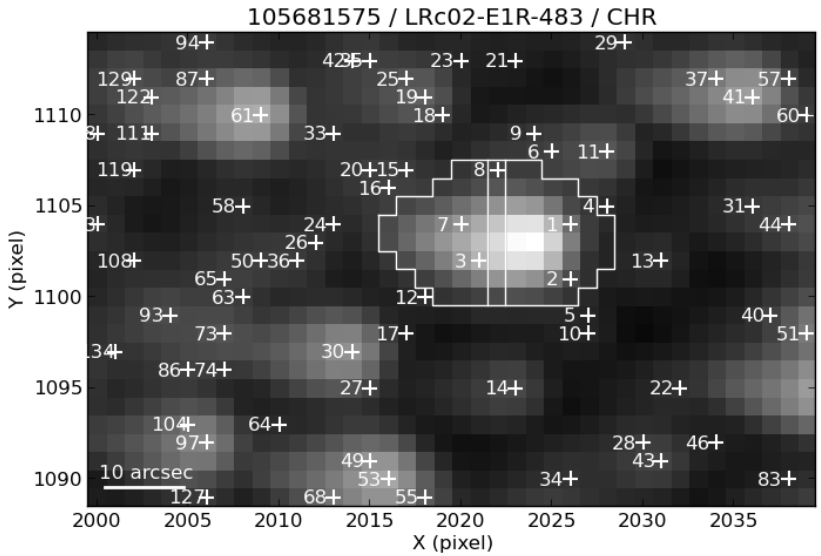


The Palomar view of LRc02-E1R-483-CHR with Exodat

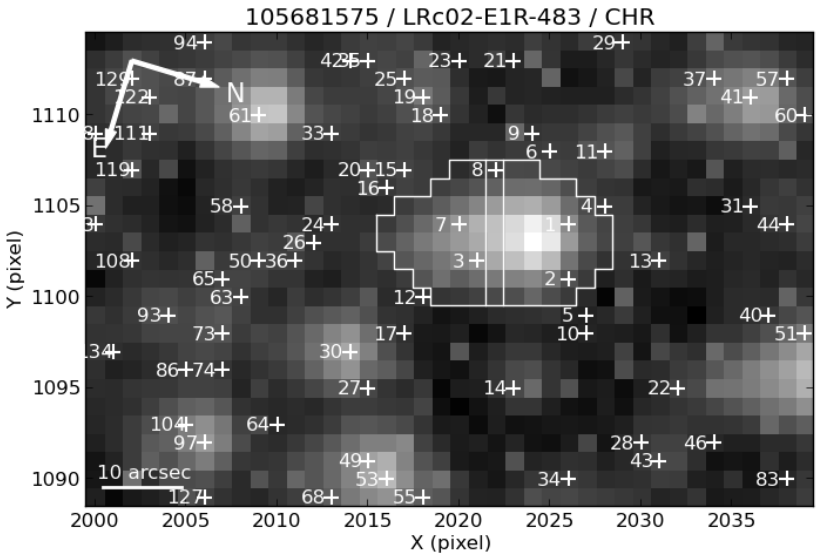


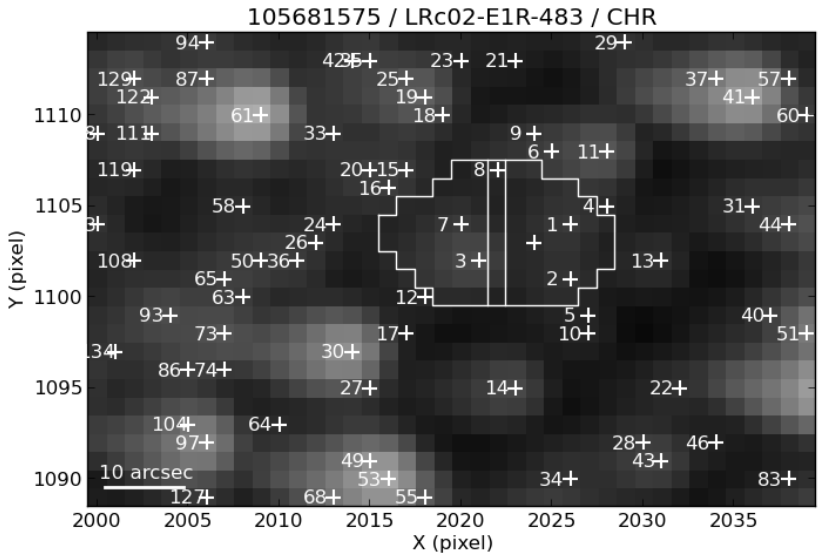
The Corot view of LRc02-E1R-483-CHR





The Corot view of LRc02-E1R-483-CHR





Contamination calculations for LRc02-E1R-483-CHR

White contamination:

#	arcsec	R	flux	%	dF/F
0	0.00	13.05	9287	97.41	0.16
1	5.82	18.90	41	0.44	34.82
2	6.38	19.20	29	0.31	50.14
3	6.92	17.79	108	1.14	13.45
4	9.73	19.86	10	0.11	> 100
5	10.51	21.24	1	0.01	> 100
6	10.62	20.26	2	0.03	> 100
7	10.80	19.34	25	0.27	57.61
8	11.44	20.10	8	0.09	> 100
9	13.59	20.73	0	0.00	> 100
10	14.41	20.45	0	0.01	> 100
11	15.44	17.29	9	0.10	> 100
12	15.68	20.60	1	0.02	> 100
13	16.22	19.30	5	0.05	> 100
14	18.31	17.94	0	0.00	> 100
15	18.65	18.94	1	0.01	> 100
16	19.00	19.54	1	0.01	> 100
17	19.24	21.47	0	0.00	> 100
18	19.26	20.51	0	0.00	> 100
19	22.85	16.94	0	0.00	> 100
20	22.88	19.42	0	0.00	> 100
24	26.27	19.88	0	0.00	> 100
25	26.89	19.95	0	0.00	> 100
26	27.20	20.21	0	0.00	> 100
30	28.09	15.33	0	0.00	> 100
31	29.23	19.44	0	0.00	> 100
33	29.98	19.19	0	0.00	> 100
36	31.05	18.98	0	0.00	> 100
40	32.26	20.02	0	0.00	> 100
44	33.29	19.24	0	0.00	> 100

Contamination calculations for LRc02-E1R-483-CHR

Color contamination:

#	red	dr/r	green	dg/g	blue	db/b
0	98.43	0.03	98.57	0.27	93.64	0.08
1	0.62	4.91	0.15	> 100	0.13	59.84
2	0.43	7.13	0.11	> 100	0.09	80.24
3	0.03	89.30	0.88	30.39	4.49	1.67
4	0.17	18.44	0.02	> 100	0.01	> 100
5	0.02	> 100	0.00	> 100	0.00	> 100
6	0.03	97.43	0.03	> 100	0.01	> 100
7	0.00	> 100	0.03	> 100	1.20	6.28
8	0.02	> 100	0.16	> 100	0.21	34.93
9	0.00	> 100	0.01	> 100	0.00	> 100
10	0.01	> 100	0.00	> 100	0.00	> 100
11	0.15	20.31	0.04	> 100	0.01	> 100
12	0.00	> 100	0.00	> 100	0.08	90.52
13	0.09	35.54	0.00	> 100	0.00	> 100
14	0.00	> 100	0.00	> 100	0.00	> 100
15	0.00	> 100	0.00	> 100	0.05	> 100
16	0.00	> 100	0.00	> 100	0.06	> 100
17	0.00	> 100	0.00	> 100	0.00	> 100
18	0.00	> 100	0.00	> 100	0.00	> 100
19	0.00	> 100	0.00	> 100	0.00	> 100
20	0.00	> 100	0.00	> 100	0.00	> 100
24	0.00	> 100	0.00	> 100	0.00	> 100
25	0.00	> 100	0.00	> 100	0.00	> 100
26	0.00	> 100	0.00	> 100	0.00	> 100
30	0.00	> 100	0.00	> 100	0.00	> 100
31	0.00	> 100	0.00	> 100	0.00	> 100
33	0.00	> 100	0.00	> 100	0.00	> 100
36	0.00	> 100	0.00	> 100	0.00	> 100
40	0.00	> 100	0.00	> 100	0.00	> 100
44	0.00	> 100	0.00	> 100	0.00	> 100

Conclusions

- For CHR light curves, the measures of transit depths in the three colors together with a careful study of the stars' environments make it possible to confidently classify some transit candidates as contaminating eclipsing binaries (CEBs), or at least to better inform follow-up operations.
- Photocenter calculations would complement this information for CHR light curves, and be especially valuable for MON light curves.