



UAK

2016

XTE J1946+274 Be/X-Işın Çiftinin X-Işın Durgun Dönemdeki Boşaltım Diskinin İncelenmesi

Mehtap Özbey Arabacı (Atatürk Üni./ATASAM)
Ascension Camero-Arranz (IEEC/CSIC)
Christina Zurita (IAC)

Detection of a large Be circumstellar disk during X-ray quiescence of XTE J1946+274

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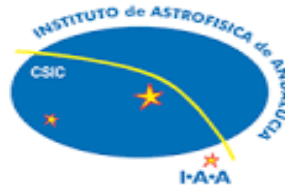
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⁷ Observatorio Astronómico de la Univ. de Valencia, C/Catedrático Jose Beltran, 2, 46980 Paterna (Valencia), Spain

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⁹ Department of Astronomy, Oscar Klein Center, Stockholm University, AlbaNova, 10691 Stockholm, Sweden

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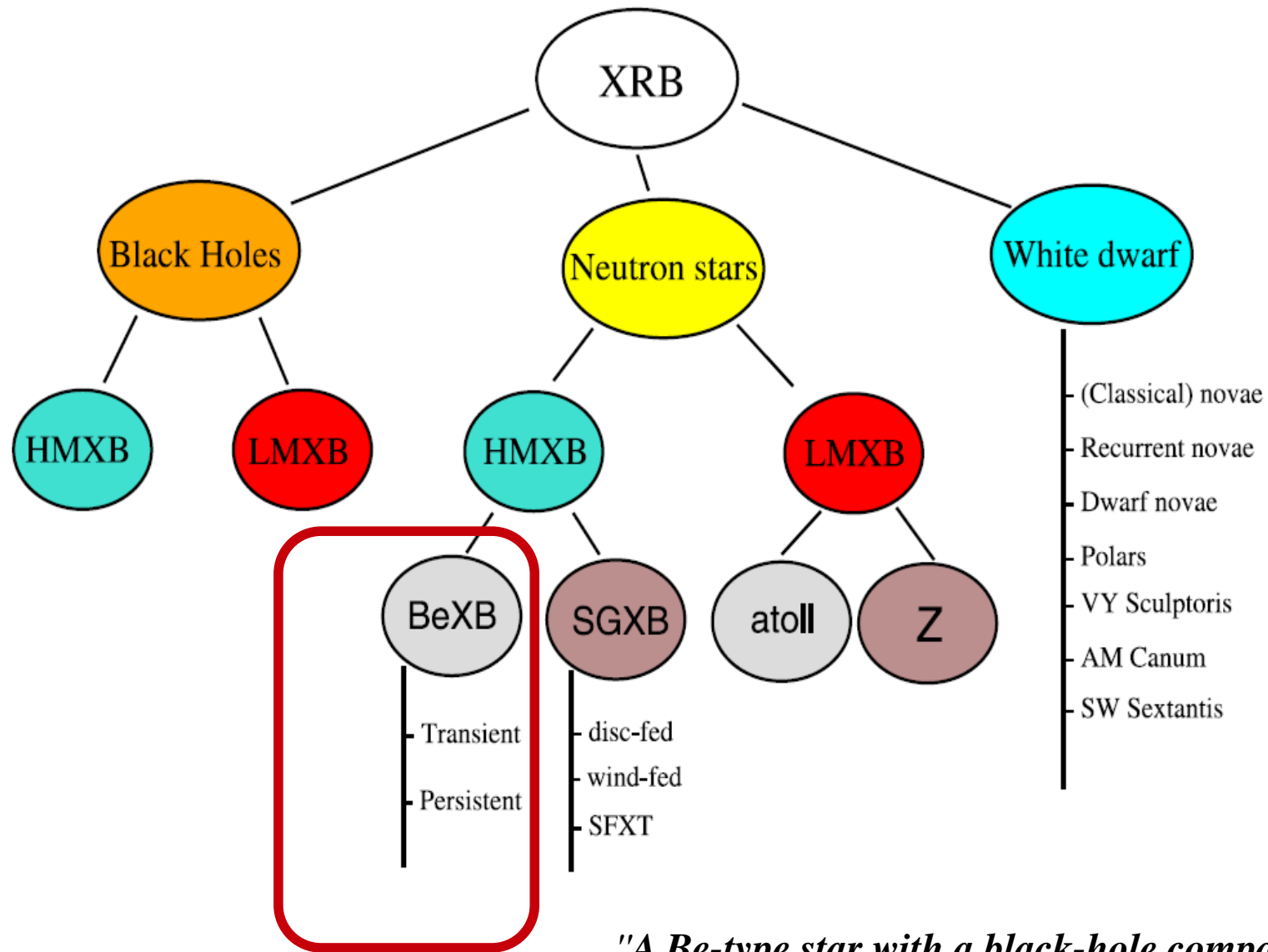


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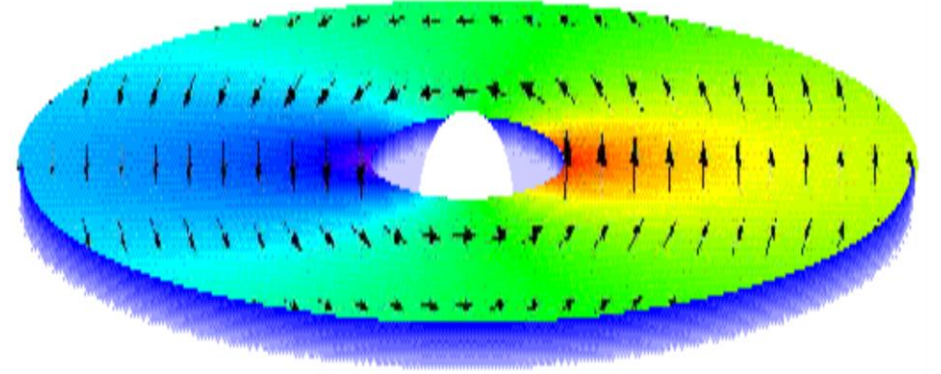




*"A Be-type star with a black-hole companion"
Casares et al. 2014, Nature, 505, 378*

Be Yıldızı

- * $M \approx 15 M_{\odot}$
- * O/B tayf türü
- * Işınım Sınıfı III-V

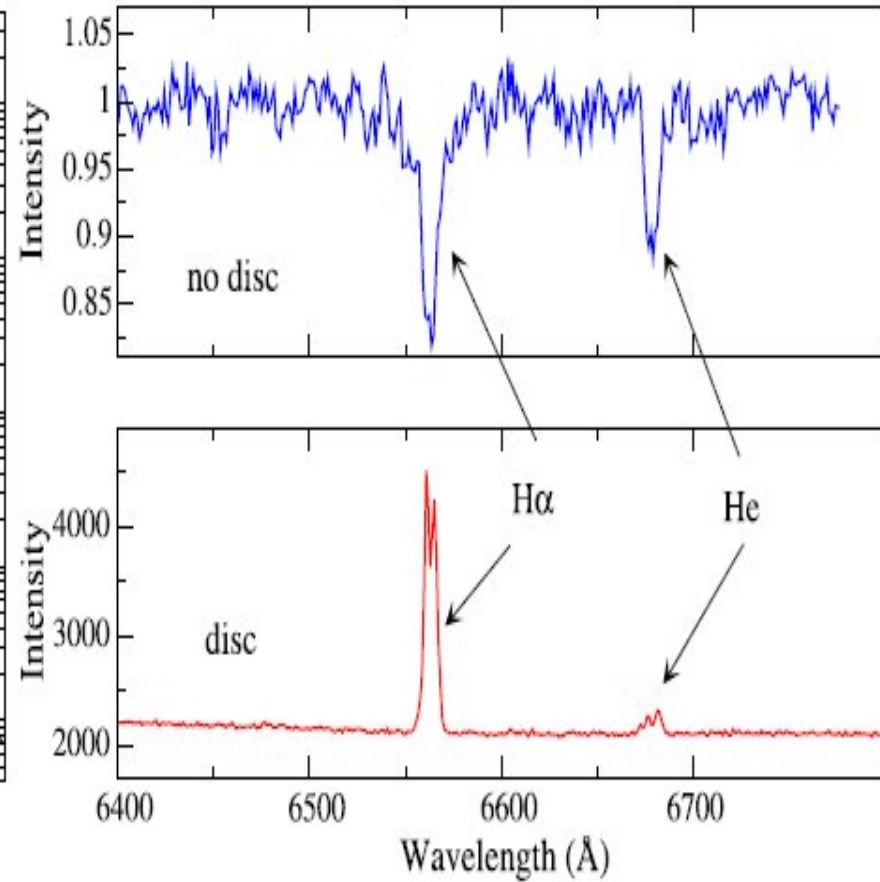
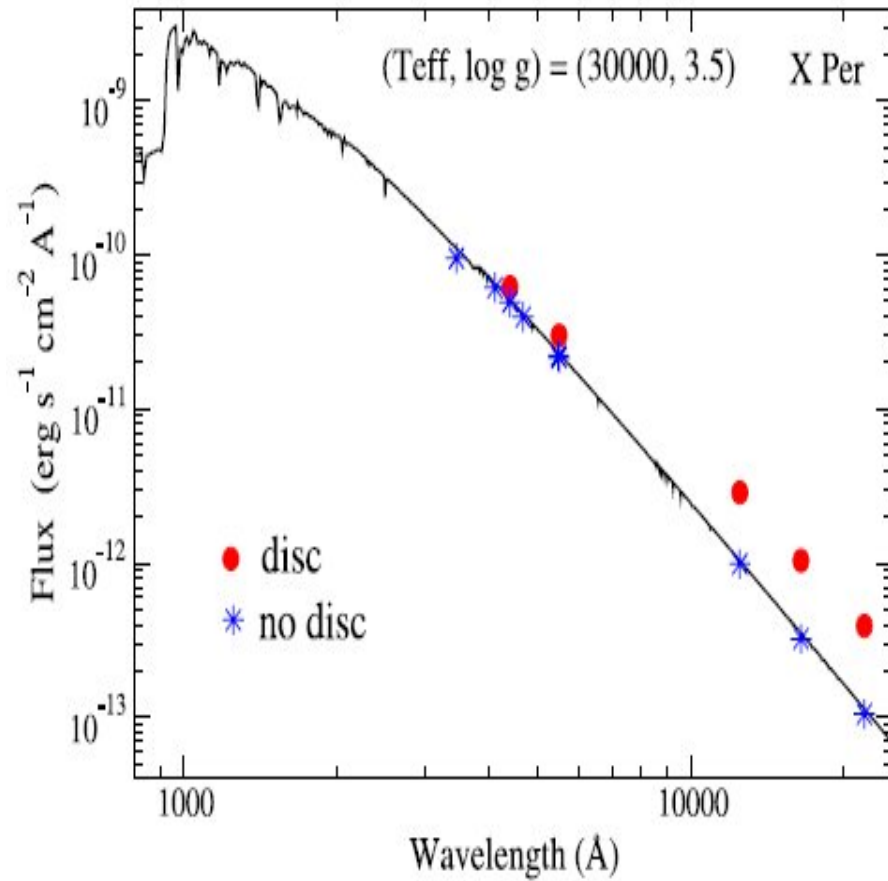


BOŞALTIM DİSKİ (DECRET)

- * Salma Çizgileri
- * IR fazlalık
- * $V_{rot} \sim 0.7-0.8 V_{crit}$
- * Radyal olmayan zonklama



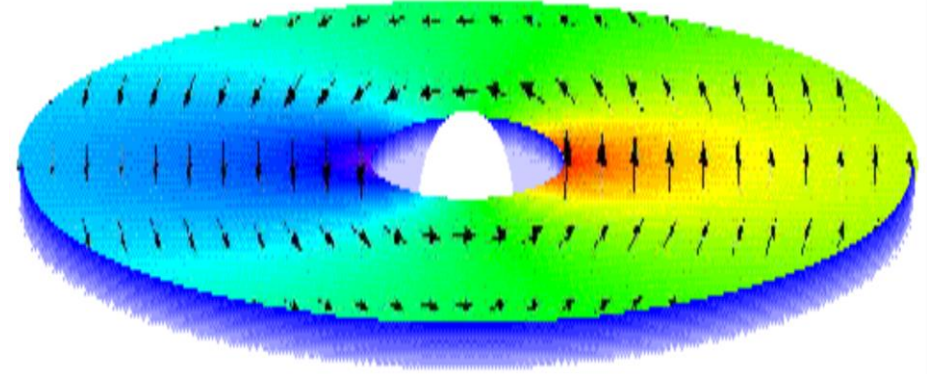
Be Yıldızı



Reig 2011

Be Yıldızı

- * $M \approx 15 M_{\odot}$
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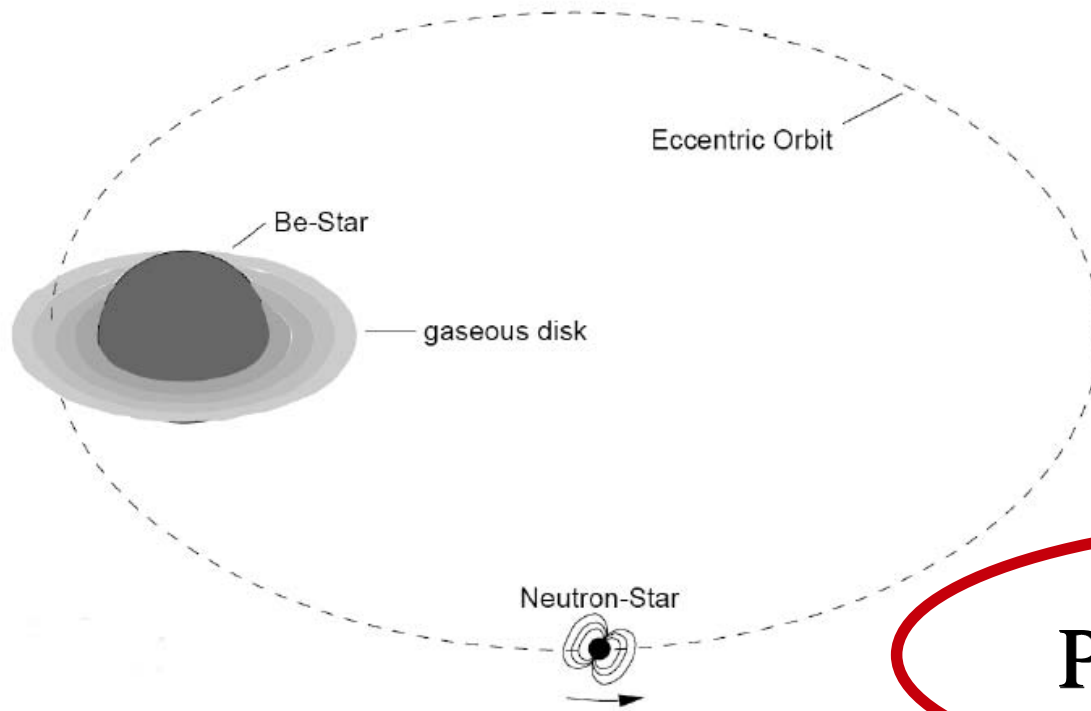


BOŞALTIM DİSKİ (DECRET)

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Be/X-IŞIN ÇİFT SİSTEMLERİ

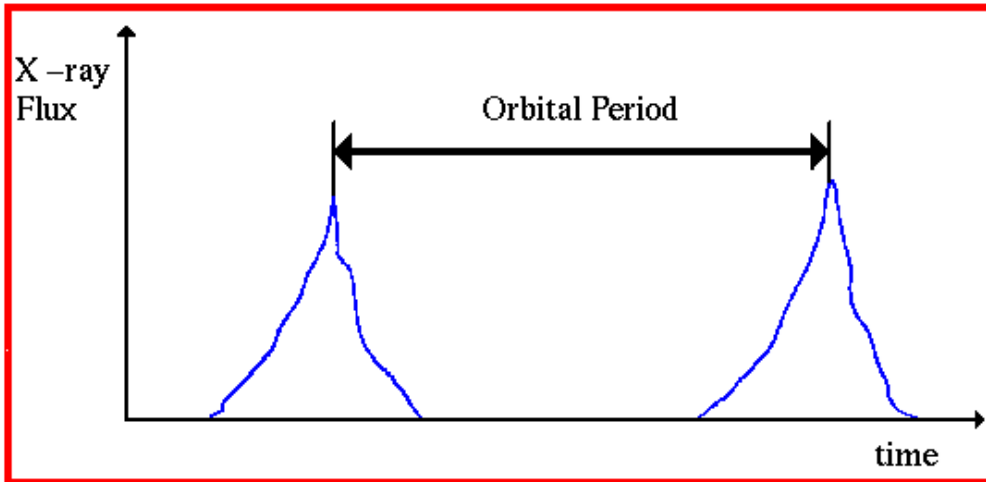
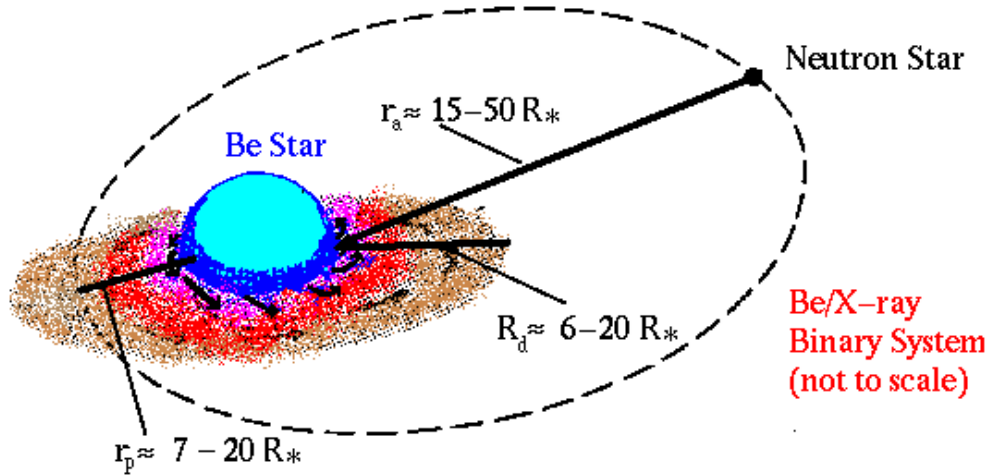


$$e \geq 0.3$$

$$P_{\text{orb}} \sim 20-300 \text{ gün}$$

$$P_{\text{spin}} \sim 3-400 \text{ s}$$

Be/X-IŞIN ÇİFT SİSTEMLERİ



Geçici Patlamalar

1. Tip I (Normal)

Enberide/yakınında

$$L_x \sim 10^{36} - 10^{37} \text{ erg/s}$$

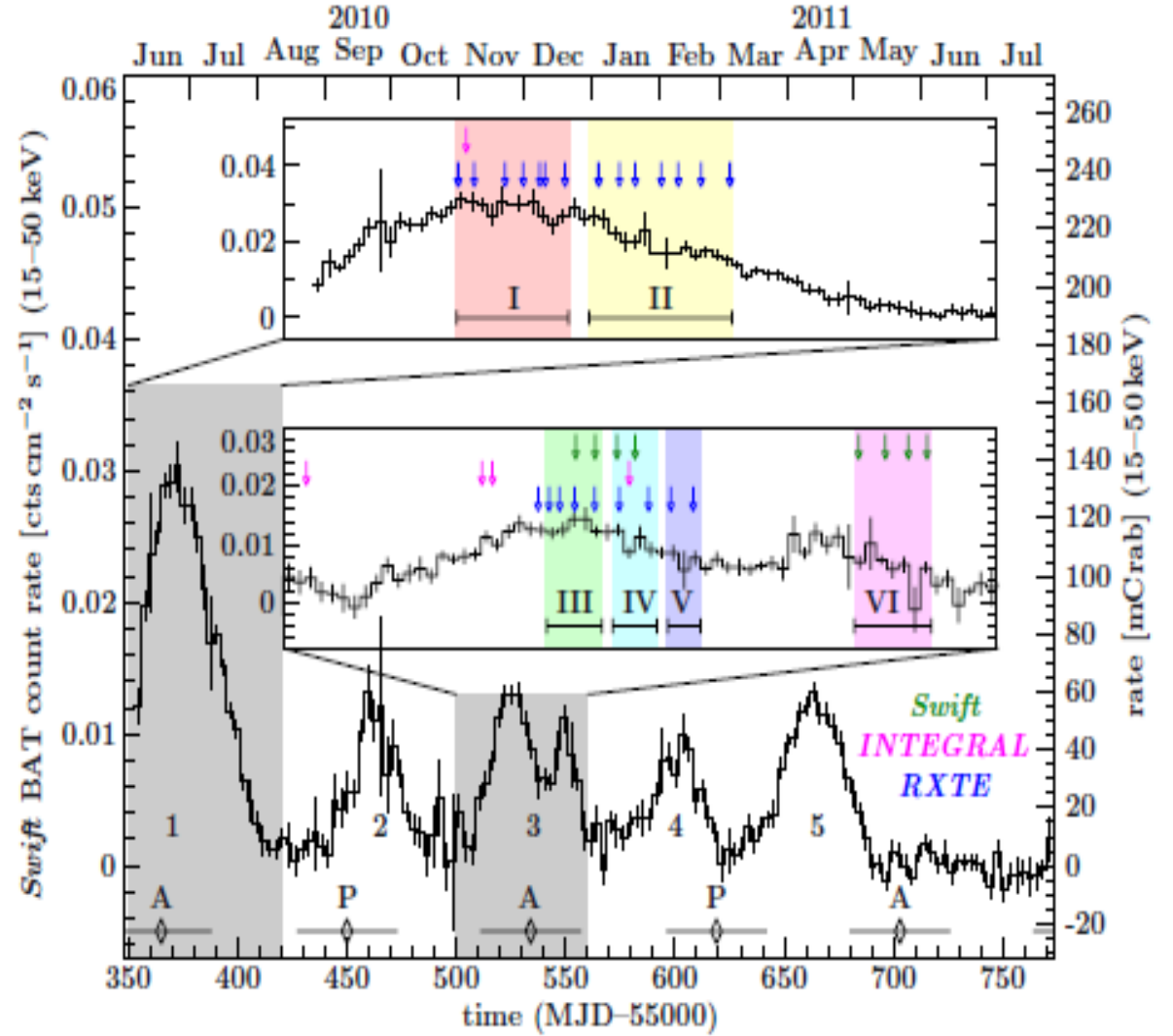
2. Tip II (Dev)

Düzensiz

$$L_x \gtrsim 10^{37} \text{ erg/s}$$

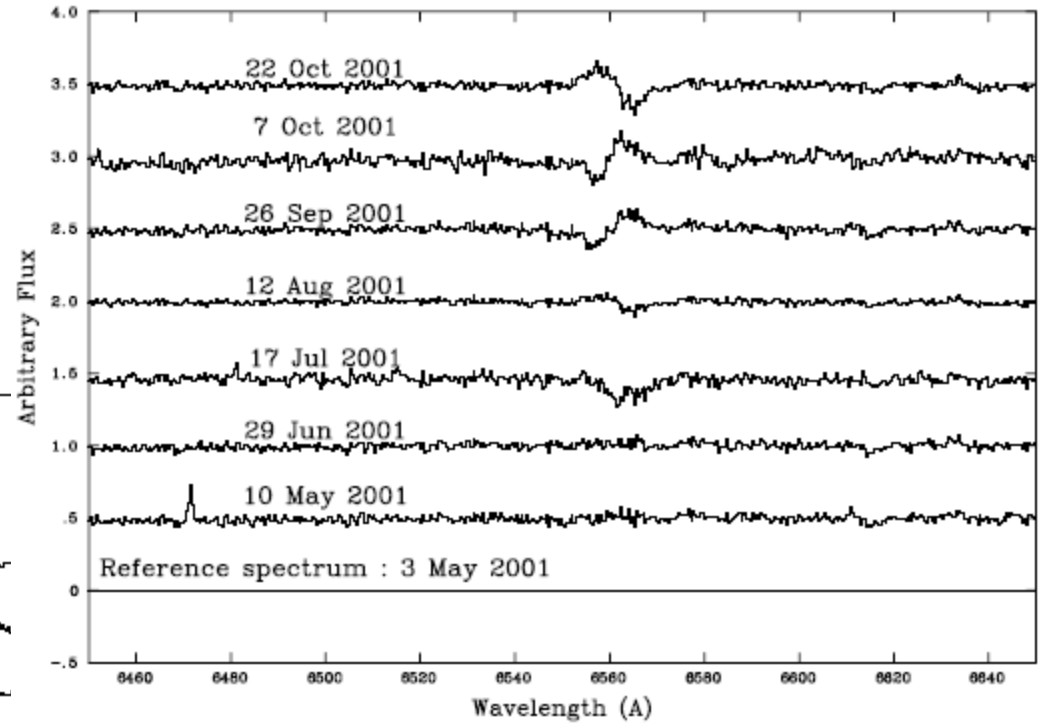
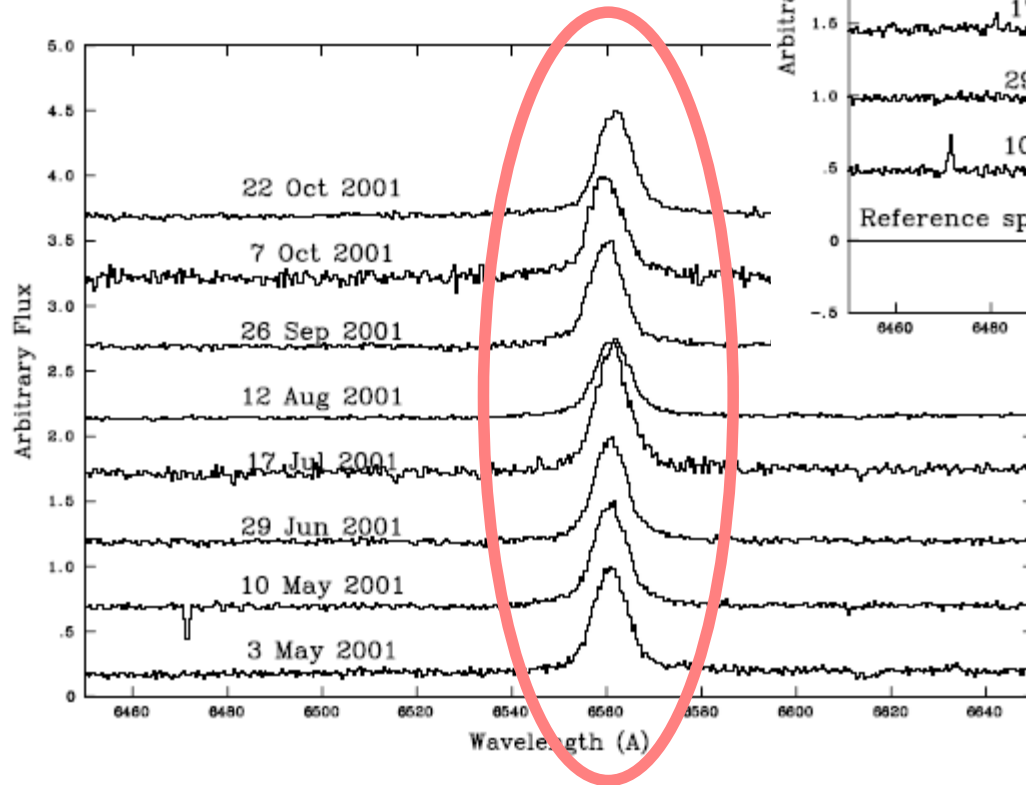
XTE J1946+274 (GRO J1944+26)

- $P_{orb}=169.2$ gün
- $P_{spin}=15.8$ s
- B0-1 IV-Ve tip
- $M_v=16.9$
- V/R değişimleri
- $d \sim 8-10$ kpc
- $e \sim 0.33$
- $i \gtrsim 46^\circ$
- Disk ve yörünge dü



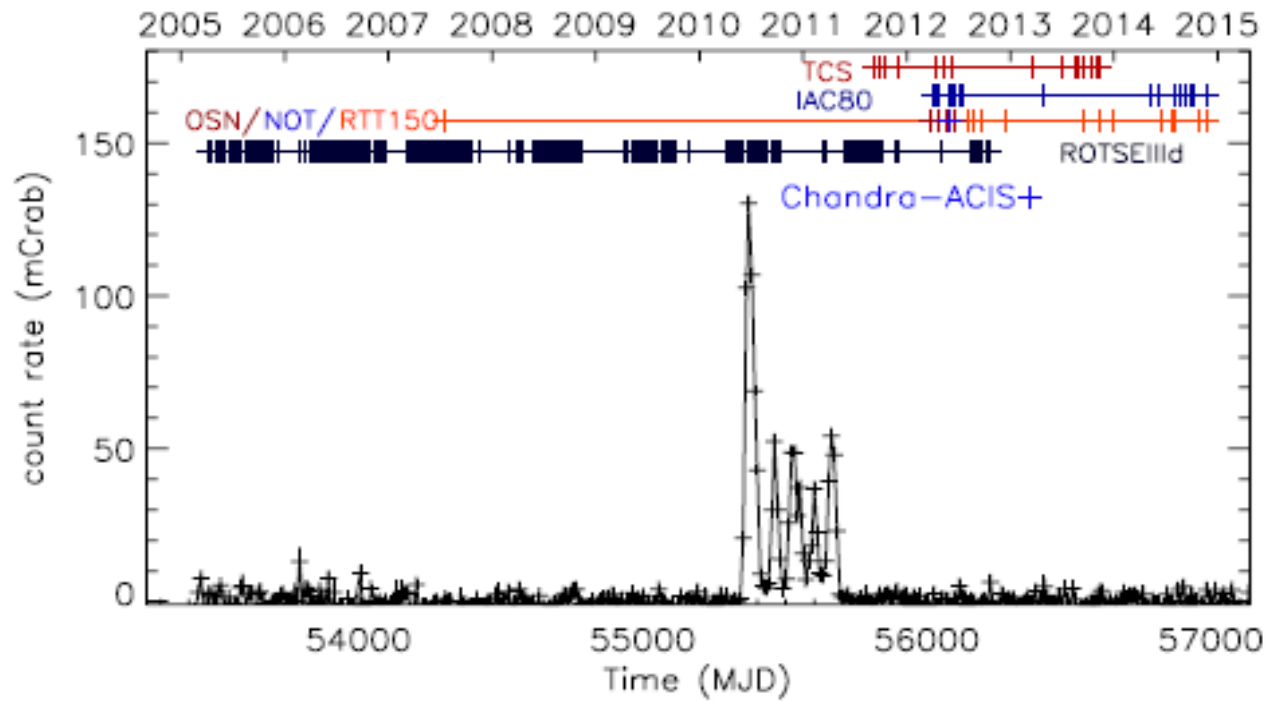
XTE J1946+274

V/R Değişimi



Wilson ve ark. 2003

UAK 2016, 5-9 EYLÜL 2016,
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Photometri

IAC80
TCS

X-Işın

Tayf

RTT150
NOT
OSN

Chandra/ACIS
SWIFT/Bat
RXTE/ASM
FERMI/GBM

XTE J1946+274-Durgun Dönem

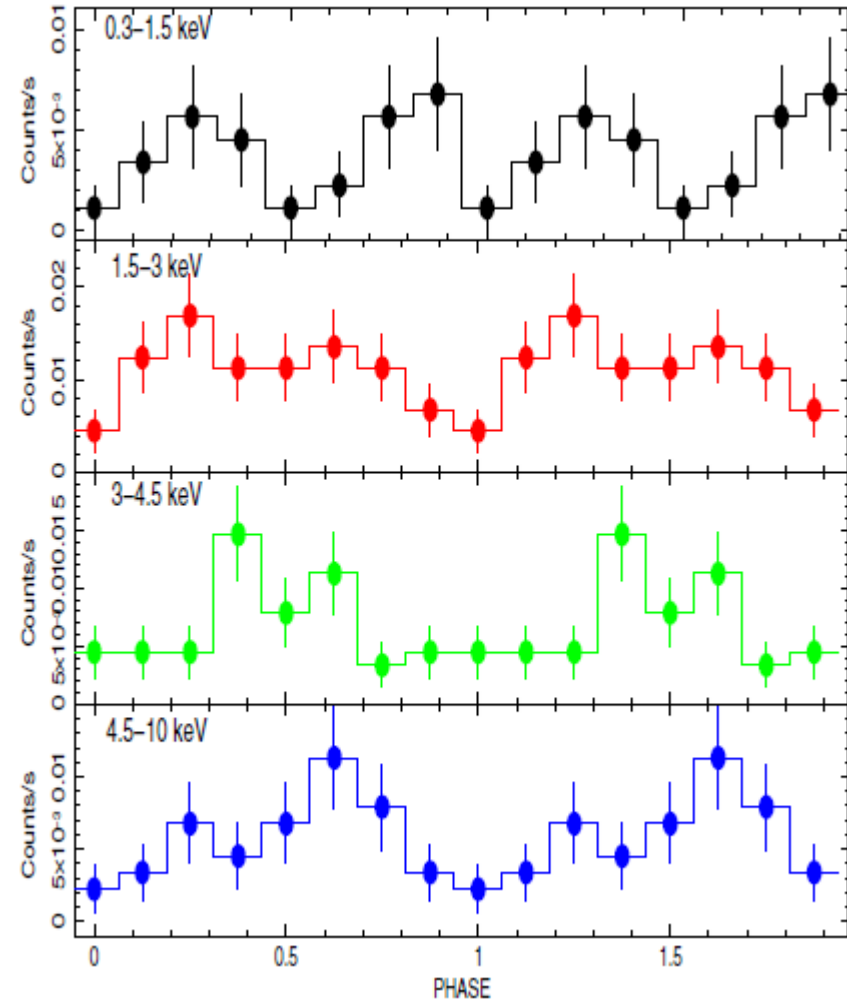
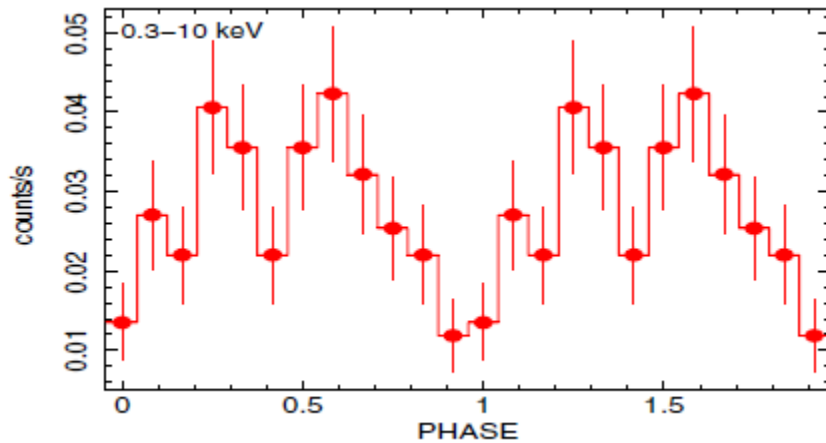
Chandra/ACIS

Toplam 4.6 ks

Zamansal Çöz. 0.4 s

CIAO----axbary

---dmextract



$P_s=15.757s$

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XTE J1946+274-Durgun Dönem

Date	MJD	<i>EW</i> (Å)	<i>FWHM</i> (Å)	Telescope
2007-Jul.-18	54 299.816	-37.35 ± 1.39	9.88 ± 0.27	RTT150
2012-Mar.-27	56 013.148	-17.73 ± 0.76	11.09 ± 0.4	
2012-Apr.-18	56 035.132	-28.49 ± 1.20	11.57 ± 0.3	
2012-May-22	56 069.014	-41.65 ± 1.31	10.19 ± 0.4	
2012-May-22	56 069.039	-40.70 ± 1.39	9.87 ± 0.1	
2012-May-28	56 075.024	-45.16 ± 1.36	10.40 ± 0.7	
2012-Jun.-19	56 097.997	-39.87 ± 1.52	10.30 ± 0.1	
2012-Jul.-4	56 112.963	-45.07 ± 1.01	9.69 ± 0.7	
2012-Jul.-5	56 113.030	-47.62 ± 0.95	10.21 ± 0.9	
2012-Jul.-29	56 137.922	-39.12 ± 0.86	10.12 ± 0.3	
2012-Aug.-11	56 150.981	-44.46 ± 1.18	10.62 ± 0.4	
2012-Aug.-24	56 163.847	-41.64 ± 1.74	10.14 ± 0.3	
2012-Sep.-15	56 185.758	-40.00 ± 0.86	9.78 ± 0.3	
2012-Sep.-16	56 186.734	-39.65 ± 1.15	9.76 ± 0.3	
2012-Oct.-09	56 209.917	-42.18 ± 1.11	11.66 ± 0.2	
2012-Dec.-11	56 272.669	-42.58 ± 2.04	10.35 ± 0.3	
2013-Sep.-08	56 543.815	-40.11 ± 1.35	9.88 ± 0.3	
2013-Nov.-08	56 604.714	-36.11 ± 0.58	13.33 ± 0.1	
2013-Dec.-26	56 652.890	-38.68 ± 1.79	14.09 ± 0.8	
2014-Jun.-19	56 827.041	-39.60 ± 0.97	9.07 ± 0.4	
2014-Jul.-17	56 855.813	-42.79 ± 1.10	9.95 ± 0.6	
2014-Aug.-03	56 872.859	-41.06 ± 0.80	9.85 ± 0.4	
2014-Oct.-20	56 950.753	-43.14 ± 1.28	9.83 ± 0.4	
2014-Oct.-21	56 951.774	-42.37 ± 1.15	9.99 ± 0.4	
2014-Nov.-22	56 983.714	-38.24 ± 1.12	10.00 ± 0.4	

Date	MJD	<i>B</i>	<i>V</i>	<i>J</i>	<i>H</i>	<i>K_s</i>
2011-Sep.-11	55 815.029			12.450 ± 0.028	-	-
2011-Sep.-23	55 827.959	-	-	12.694 ± 0.059	11.727 ± 0.048	-
2011-Sep.-24	55 828.962	-	-	-	-	11.402 ± 0.066
2011-Oct.-15	55 849.970	-	-	12.562 ± 0.000	11.789 ± 0.019	10.520 ± 0.088
2011-Dec.-05	55 900.815	-	-	12.602 ± 0.042	11.899 ± 0.152	11.260 ± 0.055
2012-Mar.-30	56 016.195	18.737 ± 0.056	15.784 ± 0.050	-	-	-
2012-Apr.-10	56 027.140	-	-	12.560 ± 0.073	11.828 ± 0.009	11.240 ± 0.105
2012-Apr.-15	56 032.192	18.803 ± 0.062	15.89 ± 0.051	-	-	-
2012-Apr.-22	56 039.195	-	15.898 ± 0.051	-	-	-
2012-May-07	56 054.179	-	-	12.734 ± 0.083	11.856 ± 0.019	11.326 ± 0.136
2012-Jun.-02	56 080.183	18.788 ± 0.055	15.835 ± 0.050	-	-	-
2012-Jun.-04	56 082.206	18.627 ± 0.074	15.784 ± 0.051	-	-	-
2012-Jun.-11	56 089.214	18.822 ± 0.069	15.793 ± 0.050	-	-	-
2012-Jun.-14	56 092.957	18.708 ± 0.063	15.841 ± 0.051	-	-	-
2010-Jul.-01	56 109.913	-	15.773 ± 0.054	-	-	-
2012-Jul.-07	56 115.892	18.863 ± 0.088	15.777 ± 0.056	-	-	-
2012-Jul.-10	56 118.885	18.726 ± 0.087	15.795 ± 0.051	-	-	-
2013-Mar.-13	56 364.225	-	-	12.504 ± 0.015	11.897 ± 0.025	11.308 ± 0.020
2013-Apr.-21	56 403.164	18.582 ± 0.042	15.666 ± 0.026	-	-	-
2013-Apr.-22	56 404.145	-	-	12.591 ± 0.007	-	11.278 ± 0.060
2013-May-03	56 415.075	-	-	12.446 ± 0.057	-	11.202 ± 0.084
2013-Jun.-30	56 473.074	-	-	12.325 ± 0.006	11.727 ± 0.071	11.227 ± 0.059
2013-Jul.-12	56 485.011	-	-	12.464 ± 0.016	-	-
2013-Aug.-11	56 515.996	-	-	12.493 ± 0.022	11.262 ± 0.068	-
2013-Aug.-28	56 532.892	-	-	12.517 ± 0.020	11.817 ± 0.009	11.255 ± 0.037
2013-Sep.-09	56 544.937	-	-	12.424 ± 0.006	11.688 ± 0.005	11.196 ± 0.023
2013-Sep.-11	56 546.022	-	-	12.324 ± 0.049	11.745 ± 0.009	11.209 ± 0.054
2013-Sep.-11	56 546.942	-	-	12.463 ± 0.031	11.845 ± 0.009	11.278 ± 0.064
2013-Oct.-09	56 574.887	-	-	-	11.799 ± 0.044	11.286 ± 0.063
2013-Nov.-01	56 597.927	-	-	12.493 ± 0.035	11.797 ± 0.007	11.269 ± 0.095
2013-Nov.-10	56 606.872	-	-	12.455 ± 0.070	11.826 ± 0.090	11.294 ± 0.007
2014-May-06	56 783.146	18.582 ± 0.047	15.683 ± 0.051	-	-	-
2014-Jun.-04	56 812.110	18.470 ± 0.058	15.591 ± 0.054	-	-	-
2014-Aug.-02	56 871.111	18.416 ± 0.043	15.565 ± 0.051	-	-	-
2014-Aug.-15	56 884.073	18.503 ± 0.049	15.489 ± 0.051	-	-	-
2014-Sep.-03	56 903.022	18.378 ± 0.044	15.537 ± 0.051	-	-	-
2014-Sep.-03	56 903.026	18.433 ± 0.045	-	-	-	-
2014-Sep.-23	56 923.926	18.441 ± 0.042	15.540 ± 0.051	-	-	-
2014-Oct.-10	56 940.007	18.272 ± 0.094	15.501 ± 0.054	-	-	-
2014-Nov.-17	56 978.825	18.558 ± 0.042	15.646 ± 0.051	-	-	-

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2012-Jun.-19	56 097.997	-39.87 ± 1.52	10.30 ± 0.11	OSN
2012-Jul.-4	56 112.963	-45.07 ± 1.01	9.69 ± 0.74	OSN
2012-Jul.-5	56 113.030	-47.62 ± 0.95	10.21 ± 0.94	OSN
2012-Jul.-29	56 137.922	-39.12 ± 0.86	10.12 ± 0.32	RTT150
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2014-Jul.-17	56 855.813	-42.79 ± 1.10	9.95 ± 0.60	RTT150
2014-Aug.-03	56 872.859	-41.06 ± 0.80	9.85 ± 0.43	RTT150
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2014-Nov.-22	56 983.714	-38.24 ± 1.12	10.00 ± 0.47	RTT150

$V_{rot} \sim 323-449$ km/s

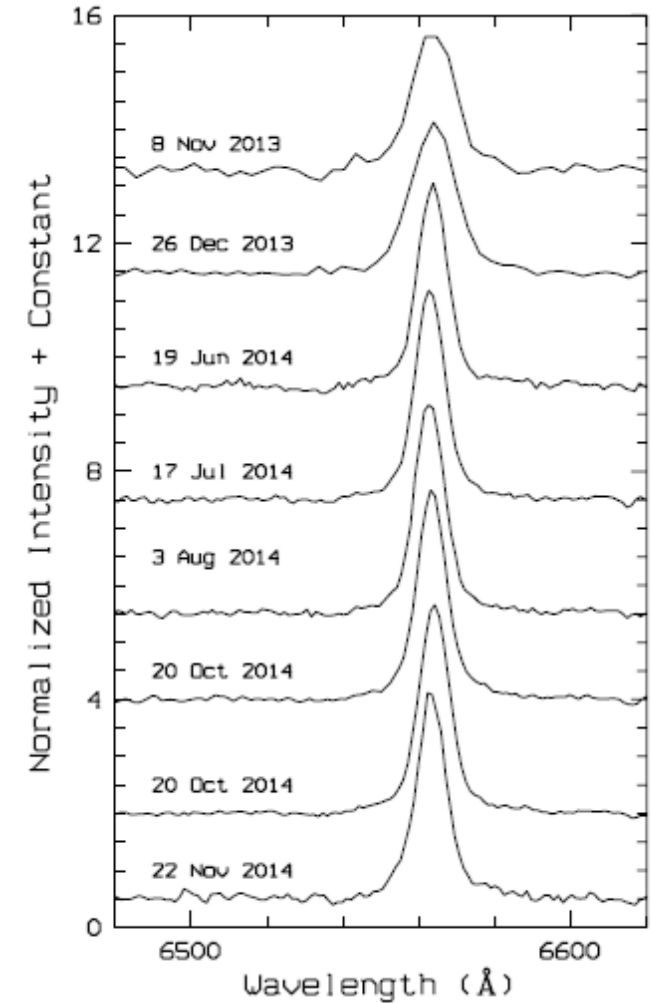
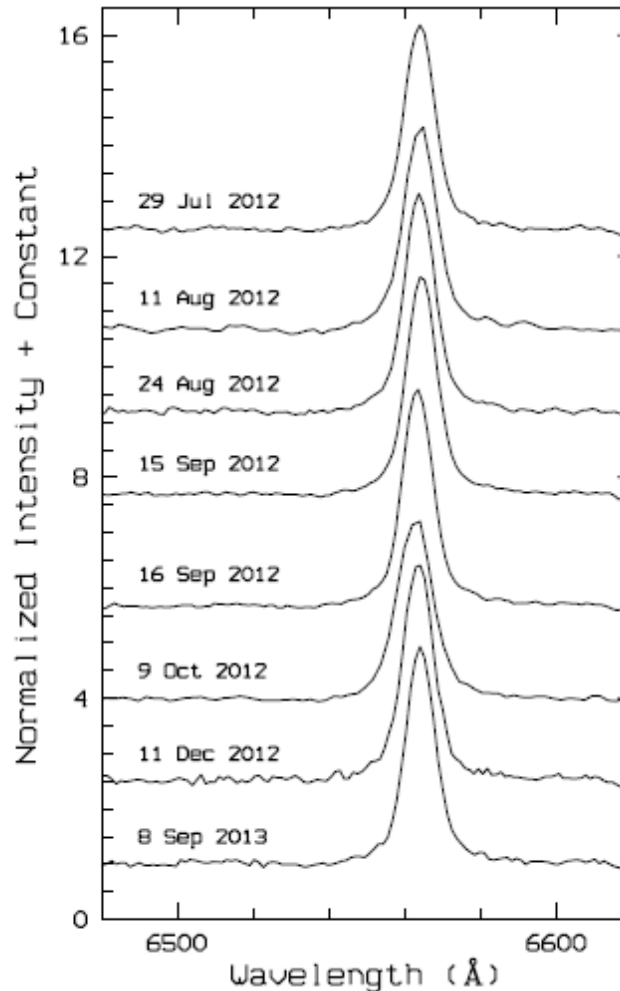
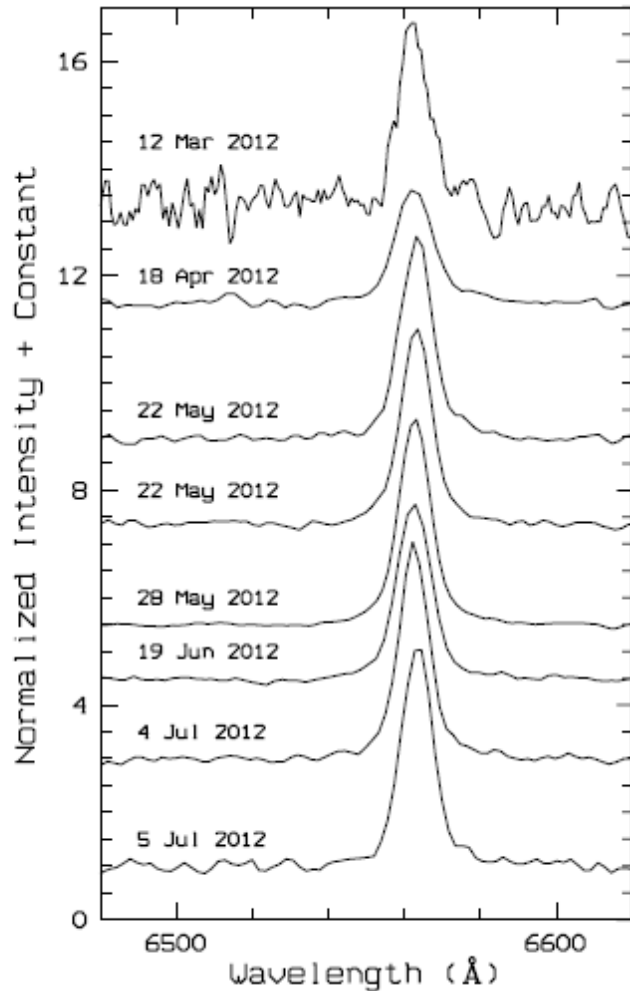


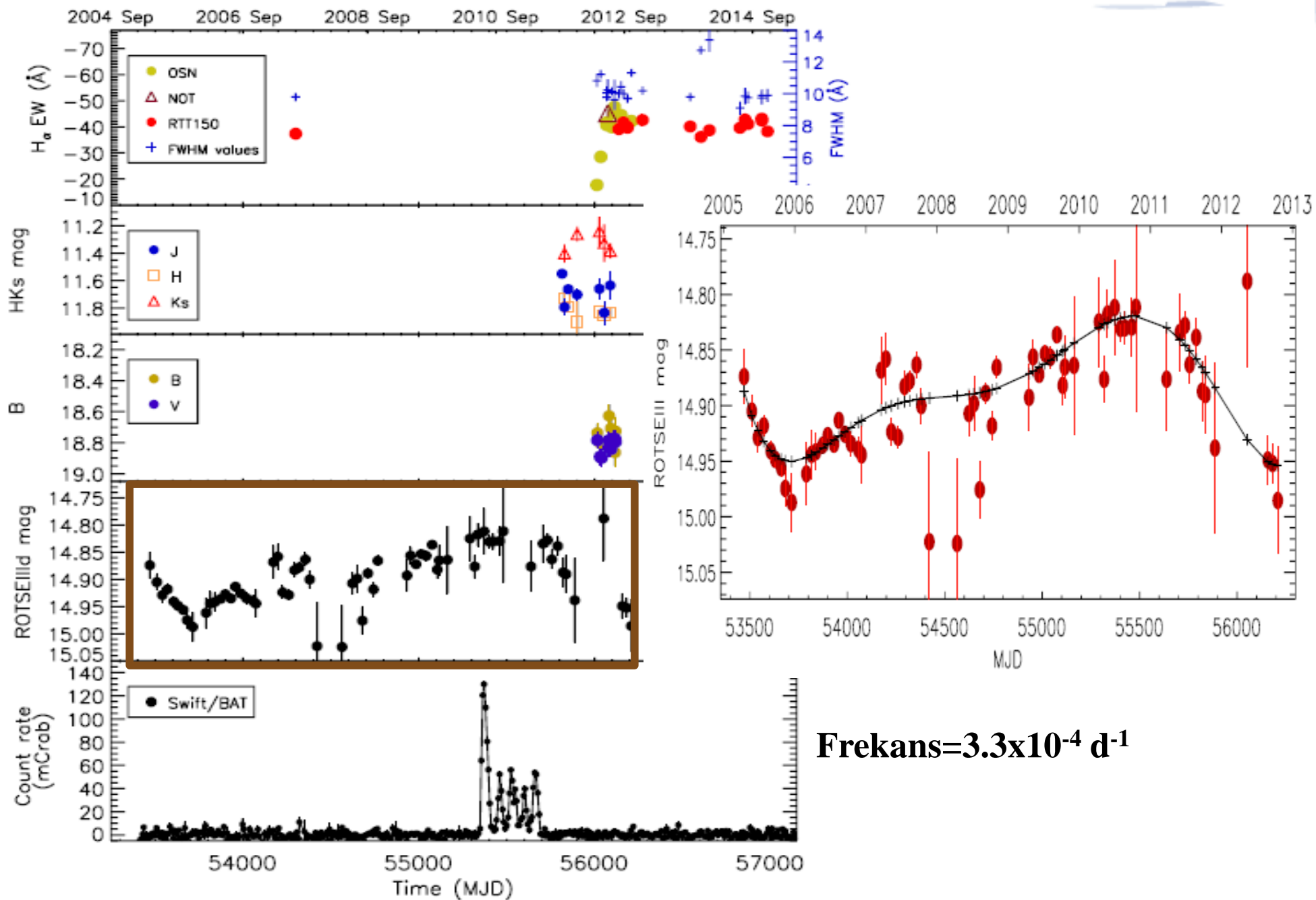
$V_{sini} \sim 323$ km/s



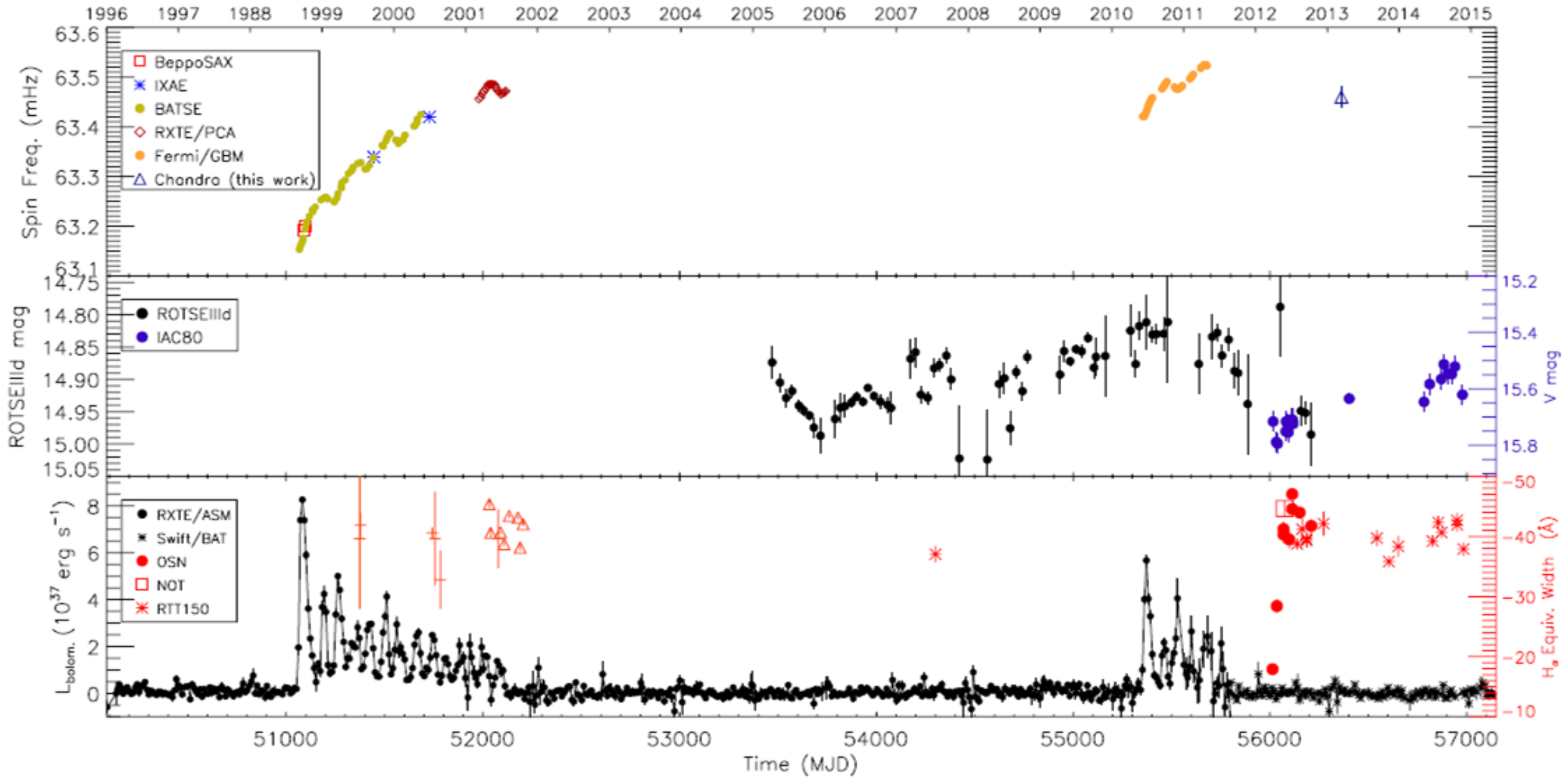
$$\log[FWHM/V_{sini}1.23+70] = -0.08\log EW + 0.14$$

XTE J1946+274-Durgun Dönem





XTE J1946+274-Durgun Dönem



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XTE J1946+274-Durgun Dönem

- 1. 2006-2013 yılları arası Be diskinden madde taşınımı**
- 2. EW yüksek, geniş boşaltım diski**
- 3. Diskin kıvrılmış bölgelerinin NY ile etkileşimi**
- 4. $L_x=1.2 \times 10^{34}$ erg/s 0.3-10 keV**
- 5. 2 yıl içinde yeni bir aktivitte?**