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Chandra and XMM–Newton Observations of H_2O Maser Galaxy Mrk 266

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Abstract. For H_2O megamaser galaxy Mrk 266, its Chandra and XMM–Newton data are analyzed here. It shows existence of two obscured nuclei (separation is $\sim 5''$). Our preferred model, the high energy reflected model can fit the hard component of both nuclei spectra well.

Key words. Megamaser—Mrk 266—Chandra—XMM–Newton.

1. Data reduction and analysis

Chandra and XMM–Newton observed Mrk 266 on November 13, 2002 with an exposure time of 20 ks and on June 8, 2003 with an exposure time of 23 ks respectively. These data were processed separately using CIAO v 4.3 and SAS v 9.0.

From the Chandra X-ray smoothed image, a double nucleus system with a large gaseous envelope is showed. For its relative lower resolution ($\sim 6''$), XMM–Newton

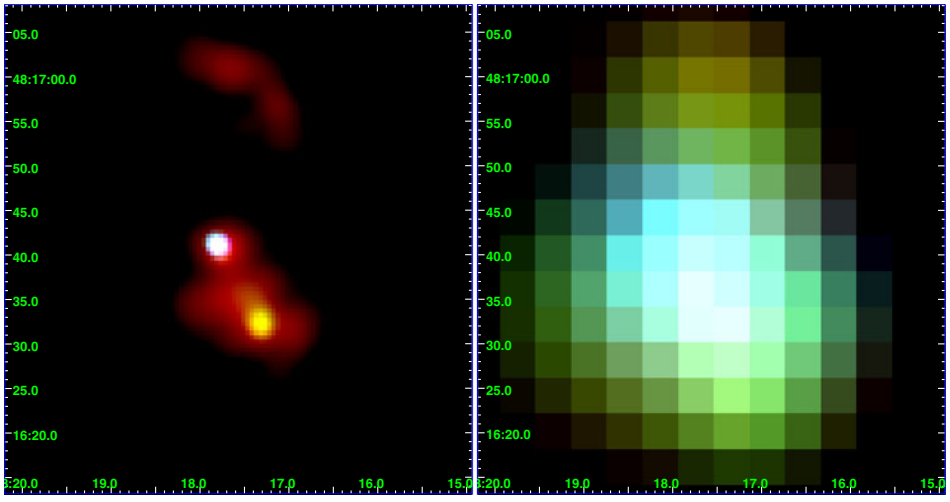


Figure 1. Adaptively smoothed three-colour image. Left: Chandra, right: XMM–Newton PN. Red: 0.3–0.8 keV, Green: 0.8–2.0 keV, Blue: 2.0–8.0 keV.

can not resolve these two nucleus. It also shows the extended gas envelope (see right panel in Fig. 1).

Table 1. Spectral fitting results of the north and south nuclei.

Nuclei	Observation	Model	$N_{\rm H}$ (10^{22} cm^{-2})	kT (keV)	Γ	χ^2/d.o.f
North	Chandra	I	–	0.67±0.06	0.22±0.15	5.7/12
		II	0	0.15±0.08	0.46±0.44	3.35/10
		III	>100	0.67±0.07	0.28±0.64	6.84/9
	XMM–Newon	I	–	0.55±0.07	0.82±0.15	30.12/28
		II	0	0.56±0.08	0.76±0.22	27.92/26
		III	>100	0.56±0.09	1.16±0.29	26.44/25
South	Chandra	I	–	0.70±0.11	1.58±0.37	11.66/9
		II	0	0.70±0.11	1.52±1.09	11.68/8
		III	>100	0.70±0.14	1.9±2.25	11.38/6
	XMM–Newon	I	–	0.39±0.09	1.73±0.22	18.64/19
		II	0	0.40±0.11	2.21±0.47	15.79/18
		III	>100	0.39	1.67	17.11/16

Model I: An absorbed thermal model plus power law (Brassington *et al.* 2007). Model II: A thermal model for soft component and an absorbed power-law for hard component. Model III: A thermal model for soft component and high energy reflect model for hard component (Zhang *et al.* 2006).

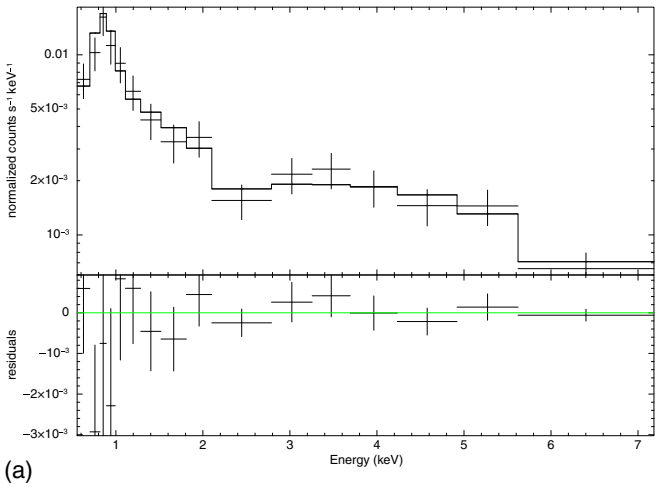
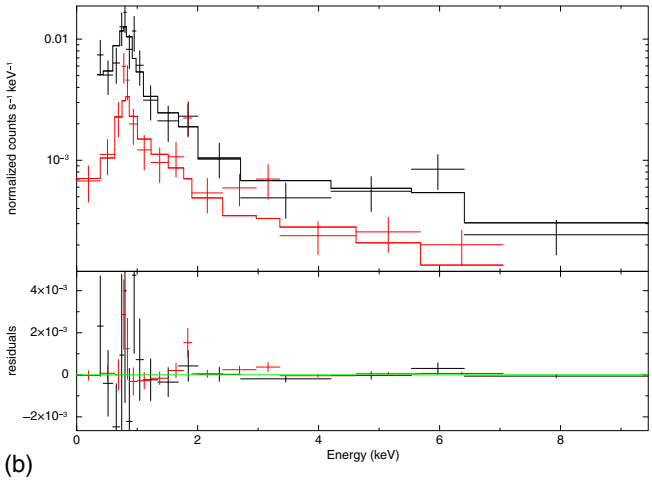
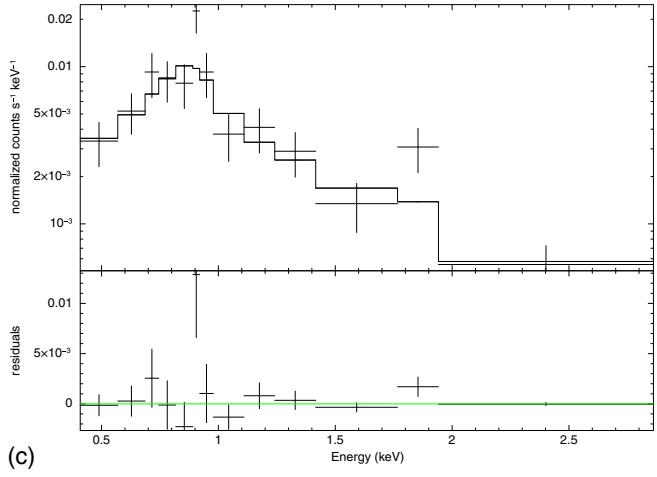


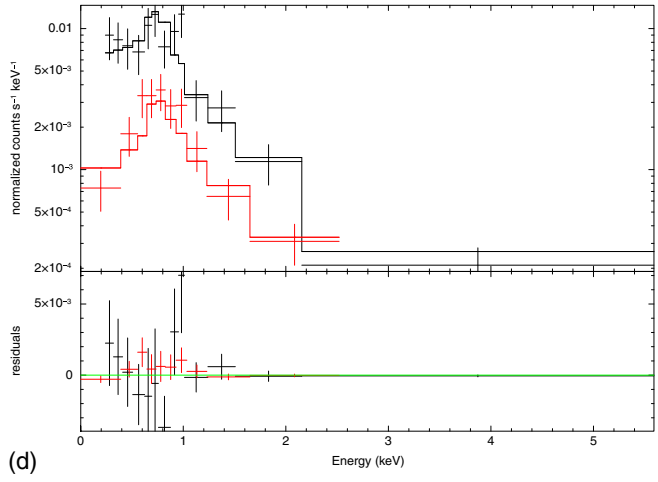
Figure 2. Spectra of the two nuclear regions (crosses) and the best fitting models (histograms, high energy reflected model for hard component). For the north nuclei: Chandra ASIC-S (**a**) and XMM–Newton pn (black) and mos1+mos2 (red) observations (**b**). For the south nuclei: Chandra ASIC-S (**c**) and XMM–Newton pn (black) and mos1+mos2 (red) observations (**d**). Residuals between data and model fitting are shown in the lower panels of each picture.



(b)



(c)



(d)

Figure 2. (*Continued*).

1.1 *Spectral analysis*

Two nucleus spectrum are extracted from the Chandra (radius is $1.5''$) and XMM–Newton (radius is $3''$) data. The spectral fits are performed using the XSPEC v 12.6.0 package. All errors quoted below correspond to 90% confidence level for the interesting parameter, i.e., $\triangle\chi^2 = 2.71$. Three alternative models were used to fit and the detailed fitting results can be found in Table 1. Figure 2 shows the spectra and the preferred fitting models.

Acknowledgement

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References

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