Long-slit spectra of the peculiar galaxy NGC 7468

O. Barsunova a; L. Shaliapina a

a St Petersburg State University, St Petersburg, Russia

Online Publication Date: 01 December 2003
To cite this Article: Barsunova, O. and Shaliapina, L. (2003) 'Long-slit spectra of the peculiar galaxy NGC 7468', Astronomical & Astrophysical Transactions, 22:6, 819 - 820

To link to this article: DOI: 10.1080/1055679031000136490
URL: http://dx.doi.org/10.1080/1055679031000136490

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LONG-SLIT SPECTRA OF THE PECULIAR GALAXY NGC 7468

O. BARSUNOVA* and L. SHALIAPINA
St Petersburg State University, University Prospekt 28, 198504 St Petersburg, Russia

(Received 15 November 2002)

Some results of a spectral study of the peculiar galaxy NGC 7468 are reported. The existence of the near-polar gas disc (or ring) in the central region is revealed.

Keywords: Peculiar galaxies; Kinematics

1 INTRODUCTION

NGC 7468 is a peculiar galaxy with a blue core resolved on three condensations and with a dwarf satellite. The photometric study shows that the galaxy belongs to the late type (Sm and Im) (Evstigneeva, 2000). It has an H II-region-like emission spectrum (Hunter et al., 1986). The galaxy is gas rich and has an extensive H I halo (Taylor et al., 1994). It was included in the Catalogue of Polar Ring Galaxies (Whitmore et al., 1990) as a possible candidate. We present preliminary results of our spectral study of NGC 7468.

2 OBSERVATIONS AND RESULTS

The observations were carried out at the prime focus of the 6m telescope of the Special Astronomical Observatory of the Russian Academy of Sciences with a long-slit spectrograph (UAGS) for five different positions of the slit. Line-of-sight velocities are determined using the strongest emission lines (Hz, [N II] and [S II]). The velocity errors are no more than 10 km s⁻¹. The radial velocity values obtained by different lines are similar.

More interesting line-of-sight velocity curves (PAs of 5° and 105° corresponding to the major and minor axes) are presented in Figure 1. The line-of-sight velocity curve (with a PA of 5°) extends to 30″ from the centre and has a linear part within |R| ≤ 15″ except for the central region (approximately 7″) where it is flat. For another slit angle (with a PA of 105°) the radial velocity curve also has a linear part (|R| ≤ 3″). These facts indicate solid-body rotation and the existence of a nuclear gas subsystem with the rotation plane nearly
orthogonal to the main galactic disc. The same gaseous nuclear subsystems were discovered in some other spiral galaxies (Sil’chenko et al., 1999).

We construct the azimuthal dependences of the line-of-sight velocity at distances of 2”, 3” and 4” from the centre. The results are quite well approximated by a cosine law (evidence of circular rotation). The fitting procedure was carried out for the dynamic axis position PA of about 60° and $v_{hel}^{sys} = 2090 \, \text{km s}^{-1}$. The exact position of this axis will be determined only after the total velocity field is constructed.

3 CONCLUSIONS

According to the features of radial velocity curves and the fitting results of azimuthal dependences of line-of-sight velocity we suspect the existence of two almost orthogonal gaseous subsystem: an ‘inner’ gas polar disc (or ring) and a gas disc of the galaxy. The results are preliminary and require more detailed analysis.

Acknowledgments

The work was supported by the Russian Foundation for Basic Research (Grant 02-02-16033) and by the Federal Program ‘Astronomy’ (Grant 40.022.1.1.1101).

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