

On the spectrum of the quasar PHL 61

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A 6-m telescope photon-counting scanner spectrum of PHL 61 is discussed.

The radio spectrum of the quasar PHL 61 (OX +057, DA +553, PKS 2134 + 004) published by Takahara et al.¹ has a possible absorption feature at frequency $\nu = 39.317$ GHz (width $\Delta\nu = 5.2$ MHz, depth $\tau = 0.15$) for which we have offered several different interpretations.

In hopes of choosing among them, we observed PHL 61 spectroscopically on 1984 August 21/22 and September 1/2 with the 6-m telescope of the Special Astrophysical Observatory, equipped with a 1024-channel photon counter. The composite PHL 61 spectrum obtained with this scanner is shown with an intensity calibration, in Fig. 1.

The spectrum lacks any of the strong ($\tau \geq 1$) Lyman- α absorption features shifted by $z_a = 1.931$, 1.878, 1.858 which ought to be observed if one of our interpretations of the 39.3-GHz radio feature is correct. We pointed out this finding in a note appended to our paper,² and it has now been independently confirmed by Chaffee et al., who in the preceding letter³ describe their higher-resolution observations of PHL 61 with Multiple Mirror Telescope (MMT) in Arizona.

This negative result might come about because the optical and radio sources differ slightly in position, so that their radiation passes through different regions.⁴ But Takahara⁵ does not rule out that the 39.3-GHz feature, although present at the 3σ level, may be spurious.

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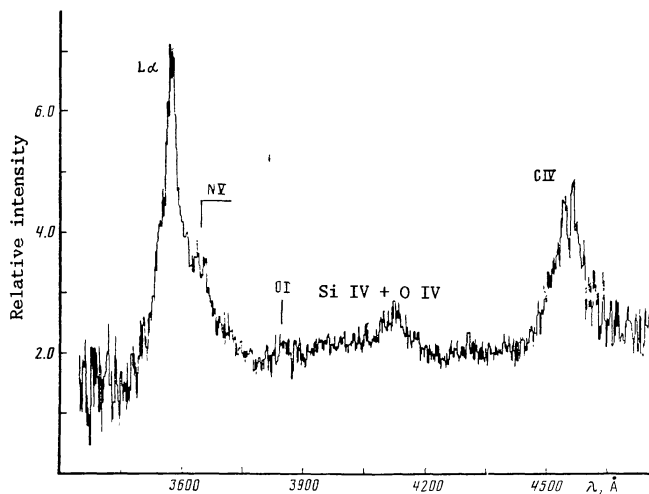


FIG. 1. The optical spectrum of the quasar PHL 61, recorded at $3\text{-}5 \text{ \AA}$ resolution (full width at half maximum) with a scanner on the 6-m telescope of the USSR Academy of Sciences in August–September 1984. The labeled $L\alpha$, O I, Si IV + O IV, C IV emission features correspond to a redshift $z_e = 1.94$.

¹F. Takahara, Y. Sofue, M. Inoue, N. Nakai, H. Tabara, and T. Kato, *Publ. Astron. Soc. Japan* **36**, 387 (1984).

²S. A. Levshakov, V. K. Khersonskii, and D. A. Varshalovich, *Astron. Zh.* **63**, 25 (1986) [*Sov. Astron.* **30**, 16 (1986)].

³F. H. Chaffee, C. B. Foltz, and J. H. Black, *Pis'ma Astron. Zh.* **12**, 819 (1986) [*Sov. Astron.* **12**, 343 (1986)].

⁴J. G. Bolton and J. V. Wall, *Austral. J. Phys.* **23**, 789 (1970).

⁵F. Takahara, private communication (1986).