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POSITIONS AND PROPER MOTIONS OF THREE NOVAE

The importance of positions and proper motions of novae for the determination of their mean parallax and mean absolute magnitude has been pointed out by Artyukhina and Kholopov (1962). Moreover, accurate measurements of novae are needed for the detection of radio emission of these stars (Fürst et al. 1986). From old and new plates of the double refractor, astrograph and AG-astrograph at Hoher List Observatory we determined positions and proper motions of the three novae V603 Aql, HR Del and GK Per.

The observational data are given in Table I, while the data of the telescopes, which were used, are given in Table II. For the plates of V603 Aql and HR Del, the field size was large enough that reference stars of the AGK3RN-system could be used (Corbin, 1979). According to de Vegt and Gehlich (1983), the AGK3RN-system is the most reliable representation of the FK4, which can be used in photographic astrometry. For all novae, we took also reference stars from the AGK3 catalog into account. The plates were measured in two (0° and 180°) orientations with the ASCORECORD of Hoher List Observatory. A reduction model with terms up to second order of the rectangular coordinates x and y was used. Astrometric tests in the field of the Pleiades have shown that this reduction model is sufficient for the reduction of astrometric measurements of plates of the double refractor (Geffert, 1986a).

For the AG-astrograph, a magnitude equation was found, but this affects only the bright stars $m < 6^m$ (Geffert, 1986b).

Our positions are given in Table III for the AGK3RN and in Table IV for the AGK3. The proper motions are given in Table V and VI. The errors σ stem from internal comparisons of the measurements of different plates at the same epoch, while the errors ϵ are due to the uncertainty of the transformation from the rectangular coordinates x and y on the plate to the spherical coordinates α and δ at the position of the nova.

Although the errors of the proper motions in the AGK3-system have smaller errors than the proper motions in the AGK3RN-system, it should be noted that, due to the local systematic errors of the AGK3, the proper motions in the AGK3RN-system are more reliable. For future work, it would be therefore very useful to have first epoch plates covering more than $4^\circ \times 4^\circ$ so that AGK3RN reference stars could be taken into account.

Table I) Observational Data

Plate	Telescope	Date	Emulsion/Filter
V603 Aql:			
B38 I	AG-astr.	12 06 1928	Agfa Scienta
B38 II	AG-astr.	12 06 1928	Agfa Scienta
N49	AG-astr.	25 07 1982	Kodak 103a-O
N51	AG-astr.	10 07 1983	Kodak IIa-O
GK Per:			
R168	refractor	22 11 1902	Matter 3601
R169	refractor	05 12 1902	Matter 3601
R170	refractor	23 12 1902	Matter 3601
R1662	refractor	11 02 1985	Kodak IIa-O
R1666	refractor	12 02 1985	Kodak 103a-O
R1671	refractor	16 02 1985	Kodak 103a-O
HR Del:			
B465	AG-astr.	08 09 1929	Agfa Scienta
3166	astr.	20 08 1978	Kodak IIa-O

Table II) The data of the telescopes

Telescope	Focal Length (cm)	Diameter (cm)	Field Size
AG-astrograph	200	11	6° x 6°
astrograph	150	30	6 x 6
refractor	500	30	1.5 x 1.5

Table III) Positions of the novae in the AGK3RN-system

Date	Alpha (1950) (h,m,s)	Delta (1950) (°, ', ")	σ_α (sec)	σ_δ (")	ϵ_α (sec)	ϵ_δ (")
V603 Aql:						
1928.4	18 46 21.458	+00 31 36.73	0.015	0.14	0.007	0.16
1983.0	18 46 21.465	+00 31 36.15	0.007	0.20	0.006	0.30
HR Del:						
1929.7	20 40 04.232	+18 58 51.35	--	--	0.008	0.15
1978.7	20 40 04.190	+18 58 51.19	--	--	0.020	0.30

Table IV) Positions of the novae in the AGK3-system

Date	Alpha (1950) (h,m,s)	Delta (1950) (°, ', ")	σ_α (sec)	σ_δ (")	ϵ_α (sec)	ϵ_δ (")
V603 Aql:						
1928.4	18 46 21.458	+00 31 36.57	0.009	0.09	0.009	0.12
1983.0	18 46 21.488	+00 31 35.67	0.004	0.02	0.014	0.20
HR Del:						
1929.7	20 40 04.201	+18 58 51.38	--	--	0.007	0.13
1978.7	20 40 04.195	+18 58 51.49	--	--	0.011	0.15
GK Per:						
1902.9	03 27 47.568	+43 44 05.46	0.009	0.08	0.013	0.14
1985.2	03 27 47.499	+43 44 04.08	0.008	0.19	0.013	0.14

Table V) Proper motions in the AGK3RN-system.
The errors σ and ϵ are mean values from both coordinates.

Name	μ_α ("/100a)	μ_δ ("/100a)	σ_μ ("/100a)	ϵ_μ ("/100a)
V603 Aql	+0.20	-1.07	0.43	0.63
HR Del	-1.22	-0.33	--	0.65

Table VI) Proper motions in the AGK3-system.
The errors σ and ϵ are mean values from both coordinates.

Name	μ_α ("/100a)	μ_δ ("/100a)	σ_μ ("/100a)	ϵ_μ ("/100a)
V603 Aql	+0.71	-1.75	0.22	0.45
HR Del	-0.17	+0.22	--	0.39
GK Per	-0.91	-1.68	0.31	0.21

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