

UBVRI photometric comparison stars around the cataclysmic variable V794 Aquilae *

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Abstract. In this note we present accurate UBVRI measurements of 3 comparison stars around the cataclysmic variable star V794 Aquilae.

Key words: stars: individual: V794 Aql – novae, cataclysmic variables

UBVRI фотометрични стандарти около катаклизмичната променлива V794 Aquilae

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В тази статия ние представяме точни UBVRI измервания на 3 звезди за сравнение около катаклизмичната променлива V794 Aquilae.

1 Introduction

The variable star V794 Aql (AN 499.1936, 1RXS J201734.6-033952) was discovered by Hoffmeister (1936) as a suspected Mira variable. The spectral and the photometric observations revealed that V794 Aql is a VY Sculptoris nova-like cataclysmic variable with orbital period $P_{\text{orb}} = 3.68$ h (Szkody et al. 1981; Honeycutt & Schlegel 1985). VY Sculptoris stars are cataclysmic variables (CVs) that exhibit pronounced high and low photometric states as the accretion rate from the donor star varies (Robinson et al. 1981; Shafter et al. 1985; Warner 1995). These variations appear to be random in amplitude, shape, and recurrence interval. In respects other than the character of its long-term light curve, V794 Aql appears to have observational properties consistent with those of members of the nova-like VY Sculptoris class (Honeycutt & Robertson 1998).

In 2005 we started photometric investigation of V794 Aql, using the telescopes of NAO Rozhen. It appeared that there are comparison stars in the field of V794 Aql in B and V bands (Henden & Honeycutt 1995) only.

Our aim here is to present accurate comparison stars in UBVRI photometric bands in the field of V794 Aql.

2 Observations

On the night of 2011 September 5, we observed V794 Aql and Landolt field 112 (Landolt, 1983, 1992) with the 50/70 Schmidt telescope of the National

* Based on observations made with telescopes of Rozhen National Astronomical Observatory, operated by the Institute of Astronomy, Bulgarian Academy of Sciences.

Astronomical Observatory Rozhen equipped with FLI PL 09000 CCD camera (3056 x 3056 px).

On the night of 2006 August 26, we observed V794 Aql and Landolt standard field PG2213-006 with the dual channel focal reducer of the 2m RCC telescope of NAO Rozhen equipped with CCD cameras VersArray (512 x 512 px) and Photometrics (1024 x 1024 px).

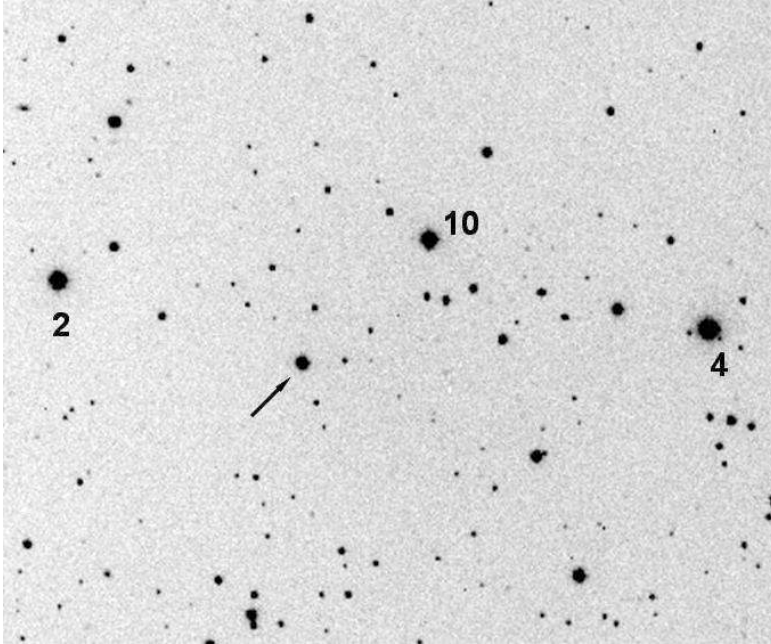


Fig. 1. UBVR photometric comparison stars around V794 Aql. The arrow indicates V794 Aql. The panel covers a $4.5' \times 4.5'$ area centered on V794 Aql.

On the night of 2010 September 8, V794 Aql and the Landolt field PG2213-006 were observed with the 2m RCC telescope of the NAO Rozhen equipped with CCD camera VersArray 1330B (1340x1300 px).

All the CCD images have been bias subtracted, flat fielded, and standard aperture photometry has been performed. The data reduction and aperture photometry are done with IRAF (IRAF is distributed by the National Optical Astronomy Observatory, which is operated by the Association of Universities for Research in Astronomy, Inc., under contract to the National Science Foundation) and have been checked with alternative software packages.

3 Results

The comparison stars are presented in Figure 1, which is prepared using GAIA and Digitized Sky at ESO. Among the comparison stars of Henden & Honeycutt (1995) we measure the stars #2, #4, and #10. Each star was observed 5 times in U and I, and 6 times in BVR bands.

Our results are summarized in Table 1. The upper part contains the star coordinates. The identifications have been taken from Henden & Honeycutt (1995), the names and the coordinates - from the Guide Star Catalog (GSC). The lower part of Table 1 contains the final magnitudes for the three stars.

On the base of our measurements we calculate the U-B and B-V colours. Using Schmidt-Kaler (1982), we derive the most likely spectral type, which is also given in Table 1.

Table 1. UBVRI magnitudes with the corresponding errors of the comparison stars around V794 Aql. In the table are also given: ID following Henden & Honeycutt (1995), The Guide Star Catalog (GSC) name, and RA/Dec coordinates for 2000.0, the spectral type (see the text) and our UBVRI measurements for the three stars

ID	Name	R.A. (2000.0)	Dec	Sp
V794 Aql -2	GSC 0516602400	20:17:39.775	-03:39:22.50	G2 V
V794 Aql -4	GSC 0516602382	20:17:24.158	-03:39:36.83	K5 V
V794 Aql -10	GSC 0516602640	20:17:30.898	-03:39:06.05	K5 V

ID	U	B	V	R	I
V794 Aql -2	14.554±0.032	14.422±0.011	13.756±0.010	13.418±0.008	13.024±0.005
V794 Aql -4	15.335±0.047	14.387±0.012	13.261±0.009	12.693±0.007	12.071±0.010
V794 Aql -10	16.433±0.051	15.263±0.015	14.101±0.012	13.528±0.007	12.907±0.011

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