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OUTBURST ACTIVITY OF BF ERIDANI IN 1999

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BF Eri was originally classified as a slowly varying variable star. The fourth edition of General Catalogue of Variable Stars listed it as a semiregular variable star with a range of 13.5–15.5 *pg*. More recent identification with the Einstein X-ray source led to the correct classification as a cataclysmic variable, which has been suggested to be a low-amplitude dwarf nova based on photometry (Kato 1999 and references therein). We report on the 1999 outburst activity of BF Eri.

The observations were done using an unfiltered ST-7 camera attached to the Meade 25-cm Schmidt-Cassegrain telescope. The exposure time was 30 s. The images were dark-subtracted, flat-fielded, and analyzed using the Java^{TM}-based aperture photometry package developed by one of the authors (TK). The differential magnitudes of the variable were measured against GSC 4743.801 (USNO r-magnitude 11.7), whose constancy was confirmed by comparison with GSC 4743.797 (USNO r-magnitude 12.3).

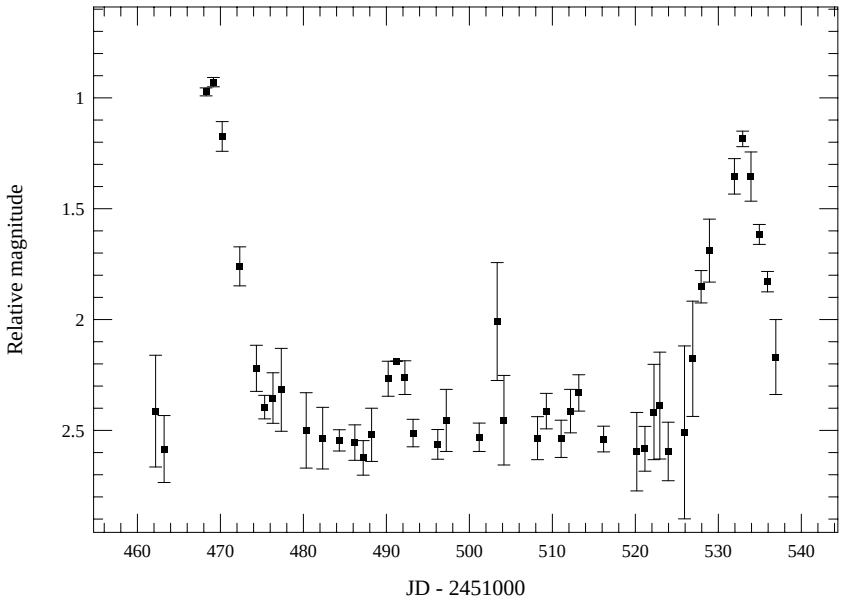

Figure 1. Light curve of BF Eri in 1999

The resultant light curve of BF Eri in 1999 is shown in Figure 1. Each point represents a nightly averaged magnitude of 3 to 10 frames, with an error bar indicating the standard error. The light curve clearly indicates the presence of two distinct outbursts, reaching maxima around JD 2451469 and 2451533. The interval between these two outbursts was 64 d, which is close to the one-third of the GCVS period (198 d), and it can be considered as a typical recurrence time of this dwarf nova. When compared to earlier observations (Kato 1999), the amplitude (1.6 mag) of outbursts is remarkably larger in this season than in the previous season, more clearly confirming the dwarf nova-type classification. The difference in the outburst activity between seasons may indicate the presence of alternating stages of low and high outburst amplitudes, as are most clearly demonstrated in Z Cam-type dwarf novae (e.g. Warner 1995).

The rise to the second outburst (JD 2451533) was well covered by observations. The slow rise took seven days, while the fade (though not completely covered by observations) was much faster. This is clearly a signature of "inside-out" type outburst (Smak 1984). The overall outburst behavior in 1999 resembles that of a low-amplitude dwarf nova, RU Peg.

References:

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Smak, J. 1984, *Acta Astron.*, **34**, 161
Warner, B. 1995, "Cataclysmic Variable Stars" (Cambridge Univ. Press, Cambridge)