Leo5 is a Z Cam Type Dwarf Nova

Patrick Wils
Aarschotsebaan 31, Hever B-3191, Belgium; Vereniging Voor Sterrenkunde, Belgium; patrickwils@yahoo.com

Tom Krajci
Astrokolkhoz, Box 1351, Cloudcroft, NM; tom_krajci@tularosa.net

Mike Simonsen
AAVSO Headquarters, 49 Bay State Road, Cambridge, MA 02138; mikesimonsen@aavso.org

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Abstract Photometry of Leo5 = 1H 1025+220 show that it is a dwarf nova of the Z Cam subtype. Two long standstills have been observed in the last five years.

1. Introduction

The Z Cam subtype is a rare class of dwarf novae, characterized by so-called standstills at an intermediate brightness level between the outburst maximum and the quiescent state. These standstills may last for a number of weeks to years, when the object does not change in brightness very much. The orbital periods of Z Cam type dwarf novae have been found to be always above the period gap for cataclysmic variables. Less than forty genuine members of the class are known (Simonsen 2011).

Leo5 = 1H 1025+220 = SDSS J102800.07+214813.5 is a little-studied cataclysmic variable (CV), discovered by Remillard and others (see Downes and Shara 1993) in the course of the HEAO-1 x-ray survey. It was classified as a nova-like variable and confirmed to be a CV spectroscopically by Munari *et al.* (1997), and more recently also by the Sloan Digital Sky Survey (SDSS; Szkody *et al.* 2009). Taylor (1999) found it to be eclipsing with an orbital period of 3.506 hours.

2. Observations

As part of its service to the study of transient objects, the Catalina Real-time Transient Survey (CRTS; Drake *et al.* 2009) publicly provide their data for a number of CVs. For Leo5 data are available from 2005 to the present (Figure 1). These data show a light curve which is typical of a low amplitude (magnitude 15.2–17.7), frequently erupting dwarf nova. On one occasion however, starting early 2008, outbursts seem to have ceased for more than a year, until the end of 2009, with Leo5 at around magnitude 16.2 all the time.

CRTS data are fairly sparse in general (at best one night of four data points each week), so that more frequent observations were called for. These were obtained in *B* and *V* through AAVSOnet starting early 2010. These data, presented in Figure 2, again show the object with frequent outbursts, varying between magnitude 15.5 and 17.5*V*, and spending little time in quiescence. Although there are not enough observations to determine the length of an outburst cycle precisely, it is estimated to be about 20 days. At the start of the 2010–2011 observing season, however, the outbursts had ceased again, and Leo5 was at an intermediate magnitude of 16.2*V*. This standstill has lasted until the present. In hindsight the classification as a nova-like variable may have been partly due to the fact Leo5 is in standstill very often or for extended periods.

3. Conclusion

Leo5 = 1H 1025+220 has been found to be a member of the rare class of Z Cam type dwarf novae, showing frequent and long standstills. Because it is also an eclipsing system, Leo5 may provide more clues to the mechanism causing the standstills.

4. Acknowledgements

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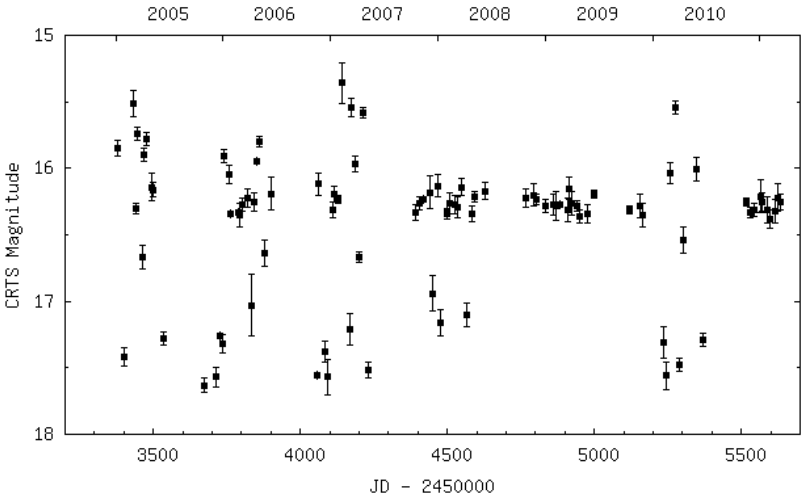

Figure 1. Light curve of Leo5 from the Catalina Real-time Transient Survey.

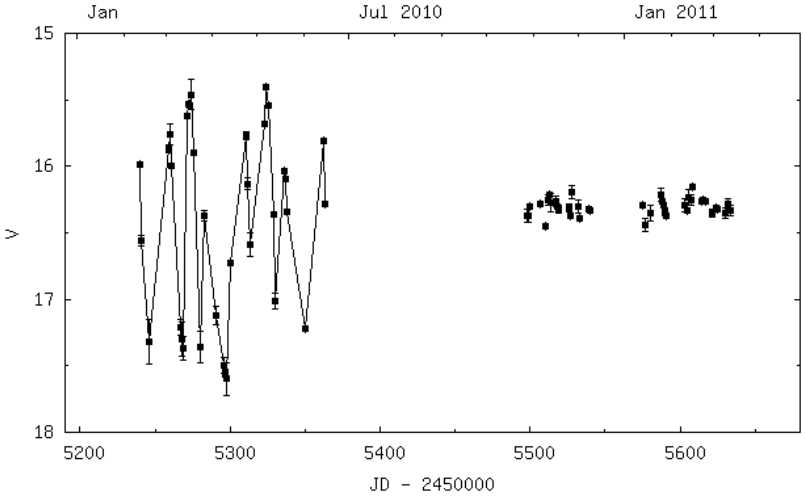

Figure 2. *V* light curve of Leo5 obtained through AAVSONet. The data points from early 2010 have been connected with lines to lead the eye.