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UVOT detection of UV outburst from an unidentified source

ATel #14997; *David Modiano (Anton Pannekoek Institute), Rudy Wijnands (Anton Pannekoek Institute)**on 25 Oct 2021; 12:48 UT**Credential Certification: David Modiano (d.modiano@uva.nl)*

Subjects: Optical, Ultra-Violet, Cataclysmic Variable, Transient

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Recently we initiated the Transient UV Objects (TUVO) project, in which we search for serendipitous UV transients in near-real time in Swift/UVOT data using a purposely-built pipeline. Using this method, we recently detected a significant (>4 magnitudes), UV-bright outburst from an unidentified source, lasting at least one week.

On October 13 our pipeline detected the transient at RA=05:09:34.36 and Dec=+05:34:13.3. The source was at AB magnitudes 19.2 ± 0.4 , 18.6 ± 0.2 , 19.7 ± 0.3 , 19.9 ± 0.3 , and 19.4 ± 0.2 in the B, U, UVW1, UVM2 and UVW2 bands, respectively, and was not detected with the V filter (3-sigma upper limit >19.3). This indicates a relatively flat outburst spectrum in the blue-UV range peaking in the U band.

We stacked all archival UVOT images in the V (total exposure time 9ks), B (10ks), U (23ks), UVW1 (43ks), UVM2 (66ks), and UVW2 (62ks) filters, and from the stacked images determined deeper upper limits at the source position of 20.3, 21.2, 22.4, 23.0, 23.6, 23.8 magnitudes, respectively. This allowed us to estimate an outburst amplitude of at least around 4 magnitudes in the U-UV (though it could be significantly greater, depending on the still unknown brightness of the source in quiescence).

In subsequent UVOT observations on October 20, the source was again not detected in V (upper limit >19.3), but it had slightly brightened in B (18.6 ± 0.3) and it had decayed in U, UVW1, and UVW2 to 19.5 ± 0.3 , 20.1 ± 0.3 , and 20.6 ± 0.3 , respectively (no data were obtained in the UVM2 filter).

A ZTF alert for a source at this position was also found (October 10), with detections in g and r bands at magnitudes of around 19.2 and 19.3, respectively, and again in the g band on October 17 at 19.8 mag. A previous detection with ZTF was made in 2019 (ZTF19abqykum) at similar brightness, indicating that this source undergoes recurrent

outbursts.

The amplitude, timescale, colour, and recurrence of the outburst may suggest that the source is an accreting white dwarf system that exhibited a dwarf nova outburst.

We are monitoring the source with UVOT in the coming week.

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