

Survey of period variations of superhumps in SU UMa-type dwarf novae. VI. The sixth year (2013-2014)

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Abstract

© The Author 2014. Published by Oxford University Press on behalf of the Astronomical Society of Japan. All rights reserved. Continuing the project undertaken by Kato et al. (2009), we collected times of superhump maxima for 56 SU UMa-type dwarf novae mainly observed during the 2013-2014 season and characterized these objects. We detected negative superhumps in VW Hyi and indicated that the low number of normal outbursts in some supercycles can be interpreted as a result of disk tilt. This finding, combined with the Kepler observation of V1504 Cyg and V344 Lyr, suggests that disk tilt is responsible for modulating the outburst pattern in SU UMa-type dwarf novae. We also studied the deeply eclipsing WZ Sge-type dwarf nova MASTER OT J005740.99+443101.5 and found evidence of a sharp eclipse during the phase of early superhumps. The profile can be reproduced by a combination of the eclipse of the axisymmetric disk and the uneclipsed light source of early superhumps. This finding shows the lack of evidence for a greatly enhanced hot spot during the early stage of WZ Sge-type outburst. We detected growing (stage A) superhumps in MN Dra and give a suggestion that some of SU UMa-type dwarf novae situated near the critical condition of tidal instability may show long-lasting stage A superhumps. The large negative period derivatives reported in such systems can be understood as a result of the combination of stage A and B superhumps. Two WZ Sge-type dwarf novae, AL Com and ASASSN-13ck, showed a long-lasting (plateau-type) rebrightening. In the early phase of their rebrightenings, both objects showed a precursor-like outburst, suggesting that the long-lasting rebrightening is triggered by a precursor outburst.

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Keywords

Accretion, accretion disks, Novae, cataclysmic variables, Stars: dwarf novae