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Possible Quasi-Periodic Oscillations in Blazars PAUL WIITA, Georgia State University, HARITMA GAUR, ALOK GUPTA, ARIES, Nainital, India, PAWEL LACHOWICZ, National University of Singapore — We have examined x-ray light curves of several BL Lacertae objects and flat spectrum radio quasars, which together comprise the blazar class of active galaxies. This data was taken with the XMM-Newton satellite. Some of these light curves contain both red-noise at lower frequencies and a break toward white-noise at higher frequencies within the roughly day-like timescales of these observations. We have searched for quasi-periodic oscillations (QPOs) in these light curves using periodograms, structure functions and wavelets. In the case of the BL Lac PKS 2155−304, we find quite strong evidence for a QPO at roughly 4.6 hours for which the total amplitude is about 5%. Because the total observation period was only 64 ks this includes only 3.8 cycles of this putative QPO and so the detection is not firm. Models involving shocks propagating down either relativistic turbulent jets or relativistic jets containing quasi-helical structures are able to explain such rapid quasi-periodic fluctuations in blazars because the amount of Doppler boosting can change substantially and quickly.

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