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### NICER Observation of Fast X-ray Flares in GX 339-4

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## NICER Observation of Fast X-ray Flares in GX 339-4

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 on 5 Oct 2017; 21:45 UT

Credential Certification: Ron Remillard ([rr@space.mit.edu](mailto:rr@space.mit.edu))

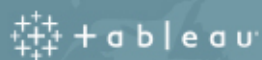
Subjects: X-ray, Black Hole, Transient

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In response to the optical alert reporting the beginning of a new outburst in the black hole binary GX339-4 (D. Russell et al., Atel 10797), a series of NICER observations began on 2017 September 29. The first five observations, conducted through October 1, netted 8.3 ks of exposure. During this time, the source exhibited an average count rate near 20 c/s at 0.3-12 keV, which can be compared to the NICER rate ~11,000 c/s for the Crab Nebula. The average hard color (4-12 / 2-4 keV) is near 0.5 or higher, which is harder than the value for Crab (0.25). These results are consistent with the report that GX339-4 is in a faint black hole hard state (Gandhi et al., Atel 10820). The net spectrum shows a broadened Fe line, but the statistics are not yet sufficient to support detailed analyses. There is no clear trend in source brightness, but the X-ray light curve is punctuated by intense flares that frequently exceed 50 c/s (1 s bins) and reach ~150 c/s on a few occasions. In 0.1 s bins, the same flares reach rates as high as 28 counts per bin (280 c/s), providing clear evidence of sub-second structure ([https://heasarc.gsfc.nasa.gov/docs/nicer/results/resources/gx339\\_pkg\\_lc\\_ts.pdf](https://heasarc.gsfc.nasa.gov/docs/nicer/results/resources/gx339_pkg_lc_ts.pdf)). These are intense examples of the flaring seen in low-hard states of many black hole binaries, and these X-ray flares very likely correspond with the sub-second optical flares reported by Gandhi et al. on the same day. Such flares are likely related to the jet observed at radio frequencies (T. Russell et al., Atel 10808). We join the effort urging additional observations of GX339-4 to further investigate the jet-accretion connection as well as possible jet contributions to the flaring X-ray emission.

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