Supplementary information

Evidence for a compact object in the aftermath of the extragalactic transient AT2018cow

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Evidence for a Compact Object in the Aftermath of the Extragalactic Transient AT2018cow Dheeraj R. Pasham^{1*}, Wynn C. G. Ho², William Alston³, Ronald Remillard¹, Mason Ng¹, Keith Gendreau⁴, Brian D. Metzger⁵, Diego Altamirano⁶, Deepto Chakrabarty¹, Andrew Fabian⁷, Jon Miller⁸, Peter Bult^{4,9}, Zaven Arzoumanian⁴, James F. Steiner¹⁰ Tod Strohmayer⁴,
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Supplementary Table 1: Upper limits on the fractional rms value of QPOs at various integer harmonics of 224 Hz (see Supplementary Figure 1).

Frequency range•	rms upper limit (coherence=5) [†]	rms upper limit (coherence=10) [†]	rms upper limit (coherence=20) [†]
$\frac{1}{2}$ × (224±16) Hz	30	25	23
$\frac{3}{2}$ × (224±16) Hz	41	32	27
2×(224±16) Hz	42	36	30

•The frequency range where the rms upper limit is computed. [†]The rms upper limit is computed for three different coherence (QPO centroid/QPO width).



Supplementary Figure 1: 2-D histograms of $\Delta \chi^2$ improvement (constant vs constant + Lorenztian) vs corresponding fractional rms of a QPO-like feature at half the observed frequency, i.e., between 104-120 Hz. These were derived using simulations (See sec. 3 of Methods for more details). The dashed vertical line in each panel corresponds to the 3σ (99.73%) level. The upper limit on fractional rms corresponds to the intersection of the histogram with the 3σ vertical line (see Supplementary Table. 1). The three panels correspond to three different coherence values (centroid frequency/width) of a QPO-like feature between 104 and 120 Hz.