

The optically detectable *LISA* source survey



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Discovery: using the Zwicky Transient Facility

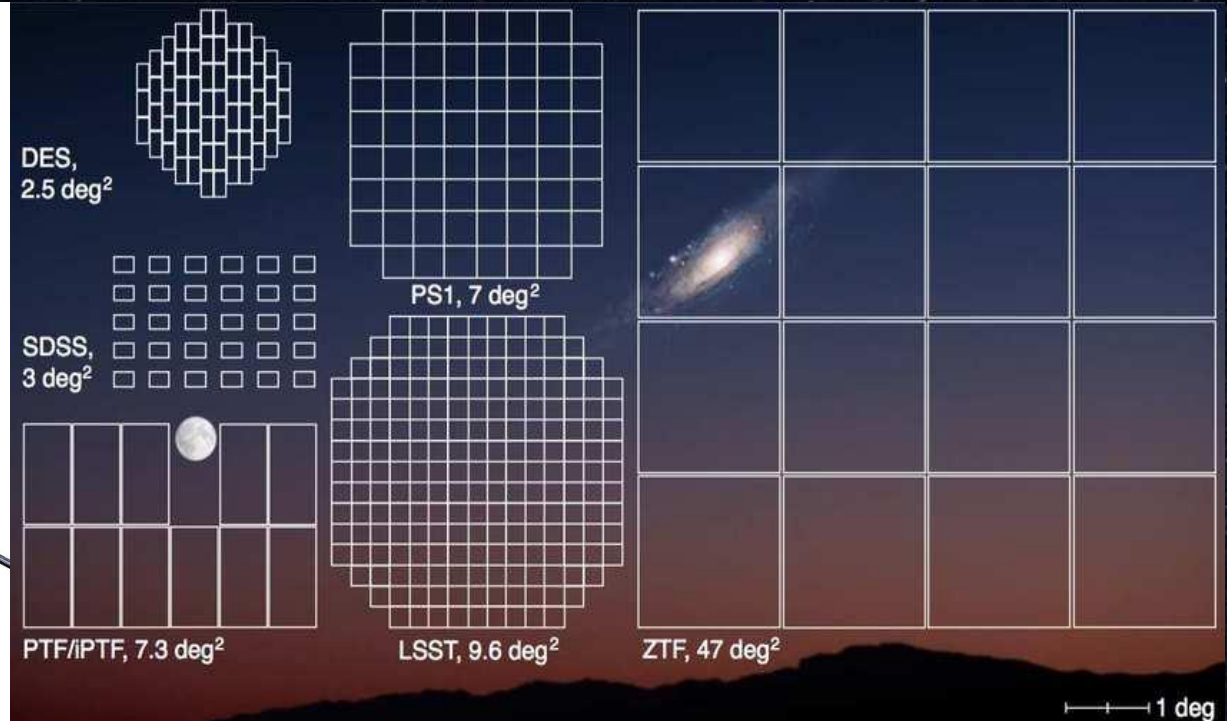
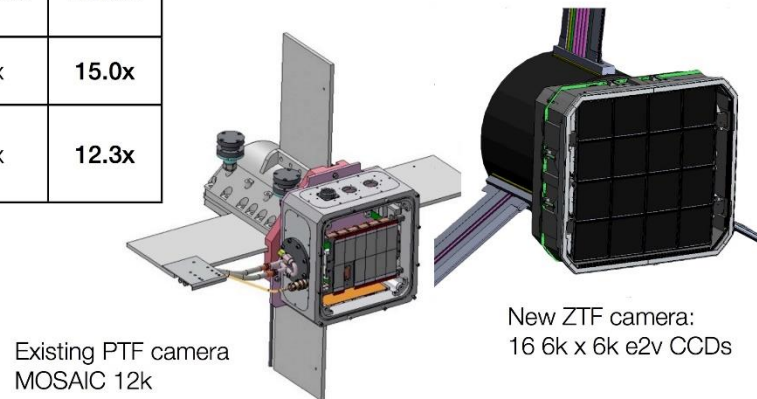
ZTF will survey an order of magnitude faster than PTF.

	PTF	ZTF
Active Area	7.26 deg ²	47 deg ²
Overhead Time	46 sec	<15 sec
Optimal Exposure Time	60 sec	30 sec
Relative Areal Survey Rate	1x	15.0x
Relative Volumetric Survey Rate	1x	12.3x

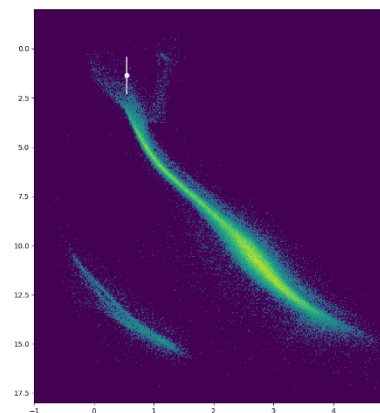
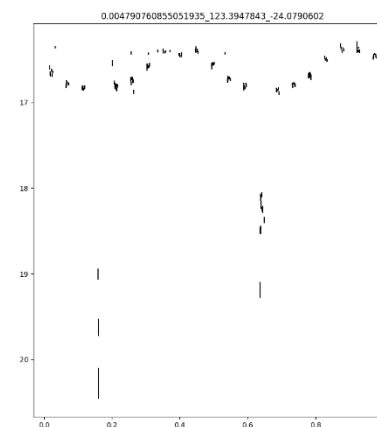
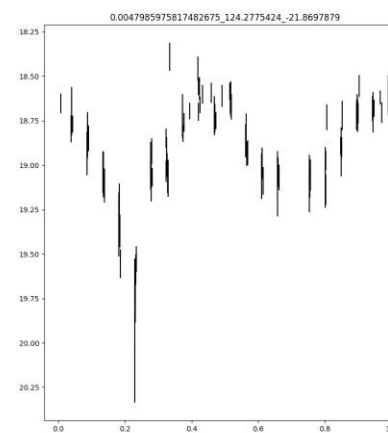
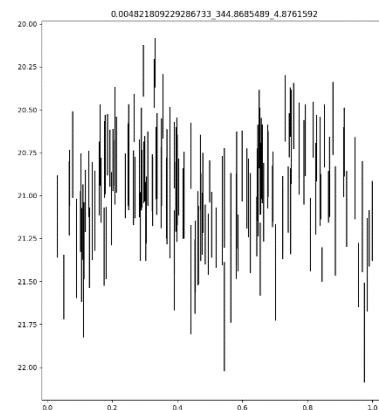
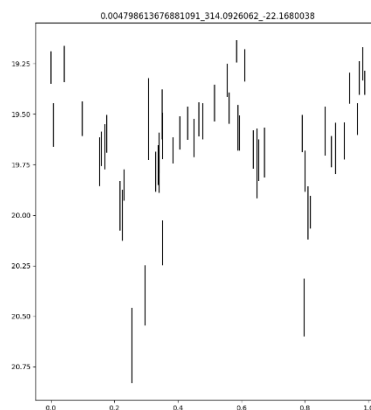
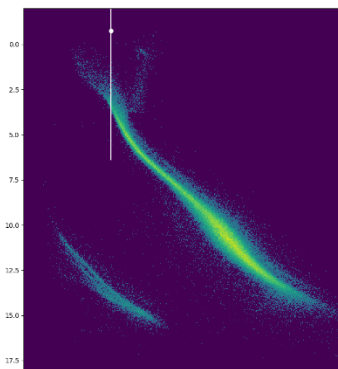
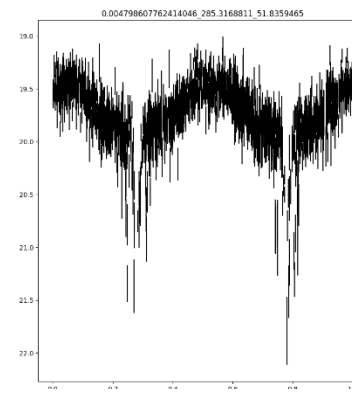
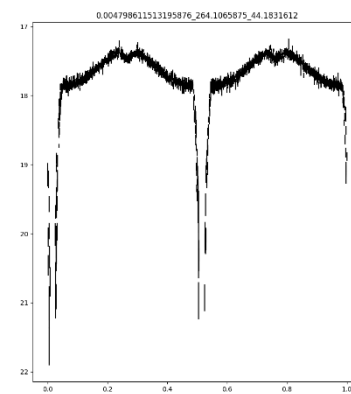
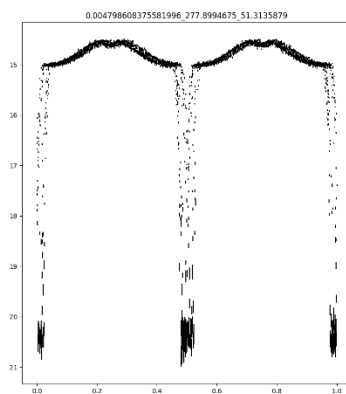
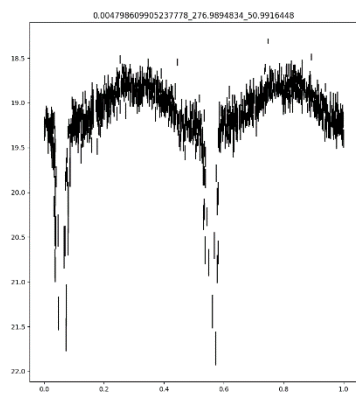
3750 deg²/hour

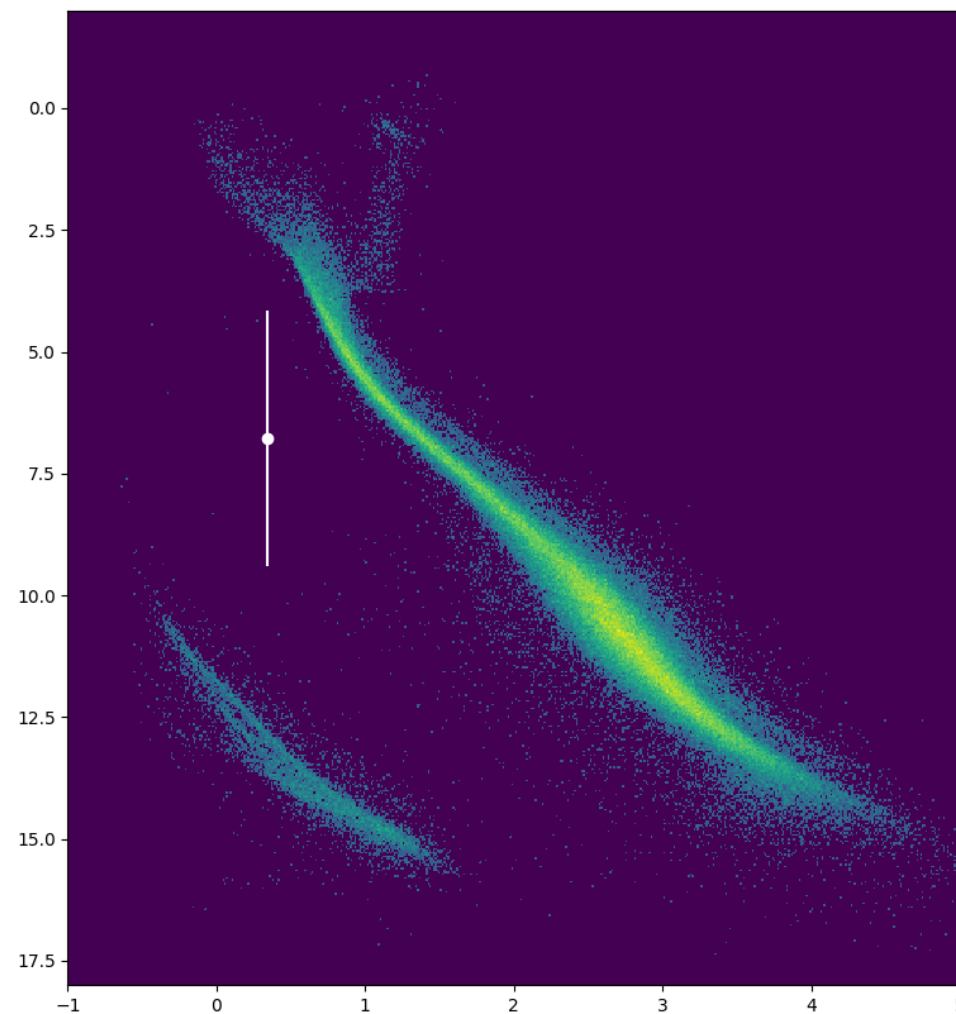
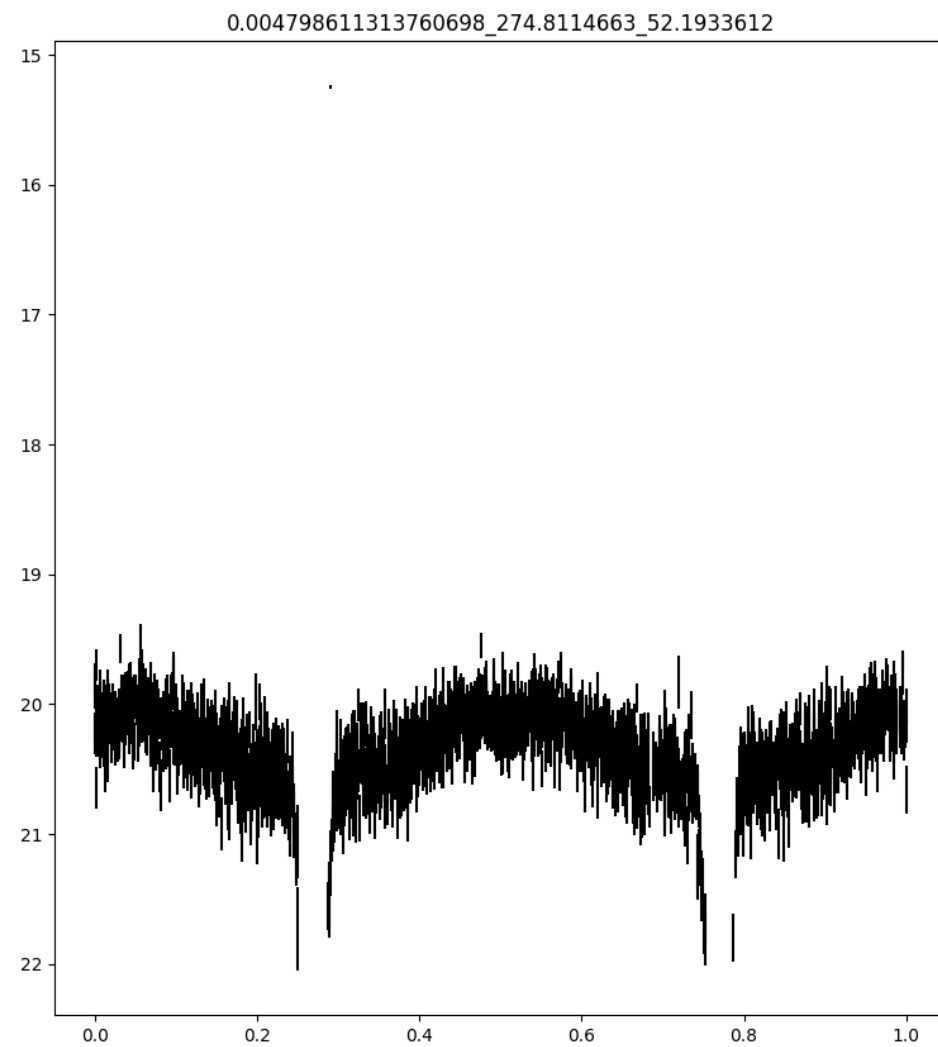
⇒ 3π survey in 8 hours

>250 observations/field/year
for uniform survey

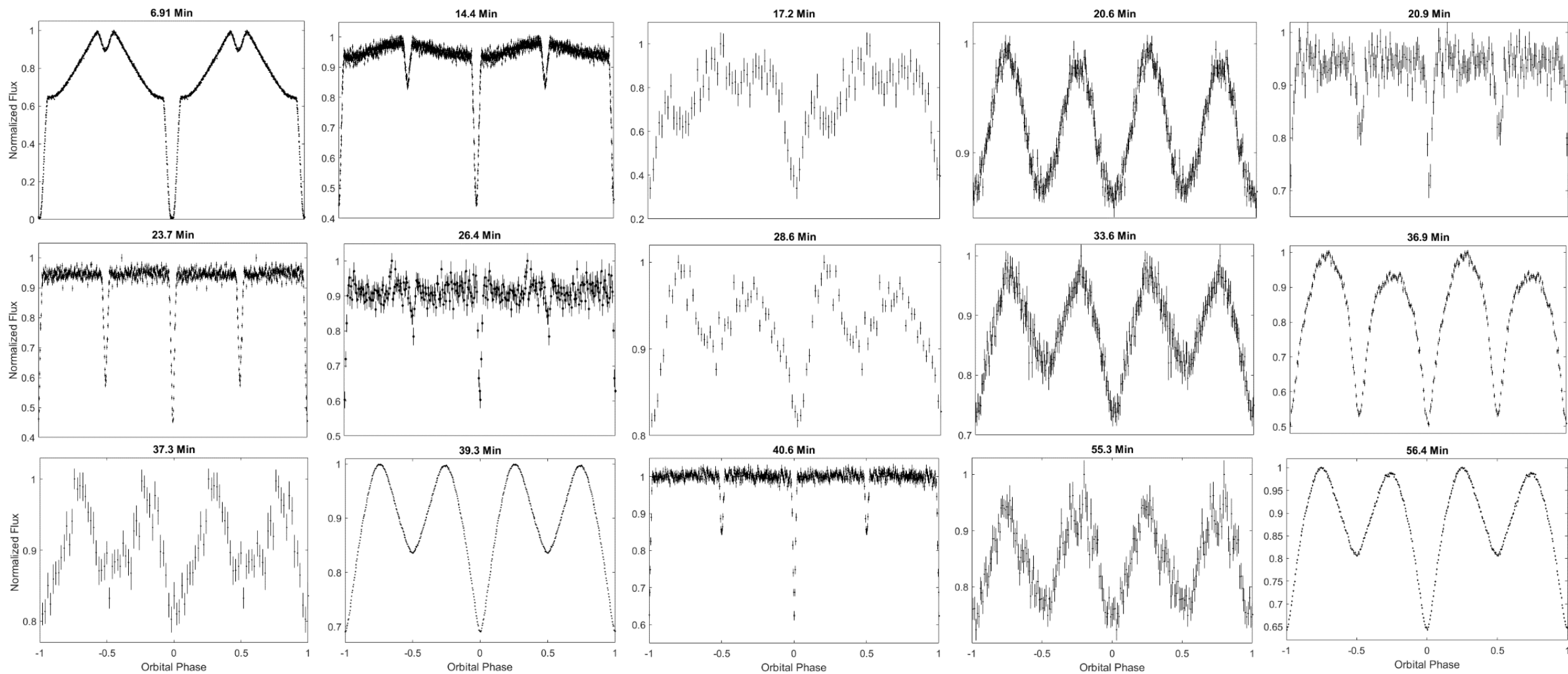


The crucial element: ZTF has a large field of view, and accumulates many epochs quickly

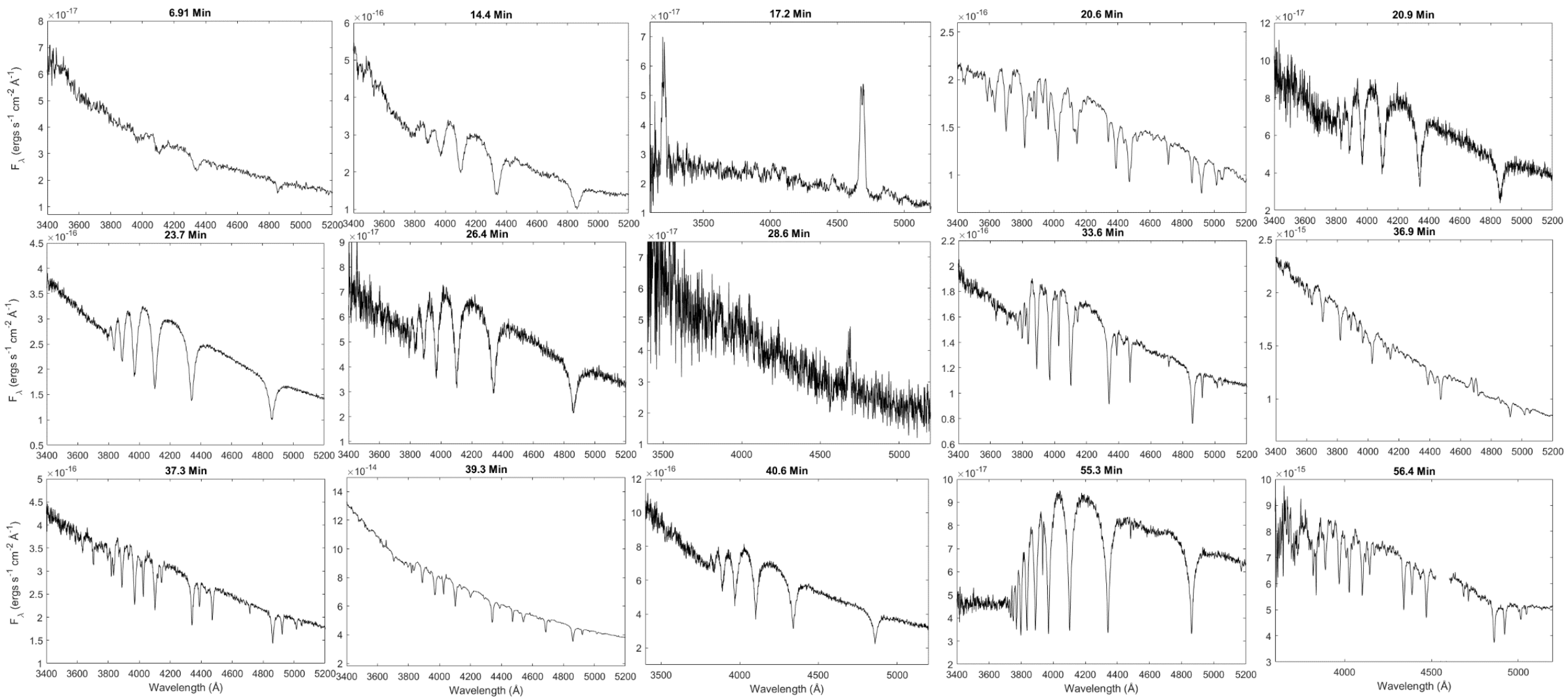


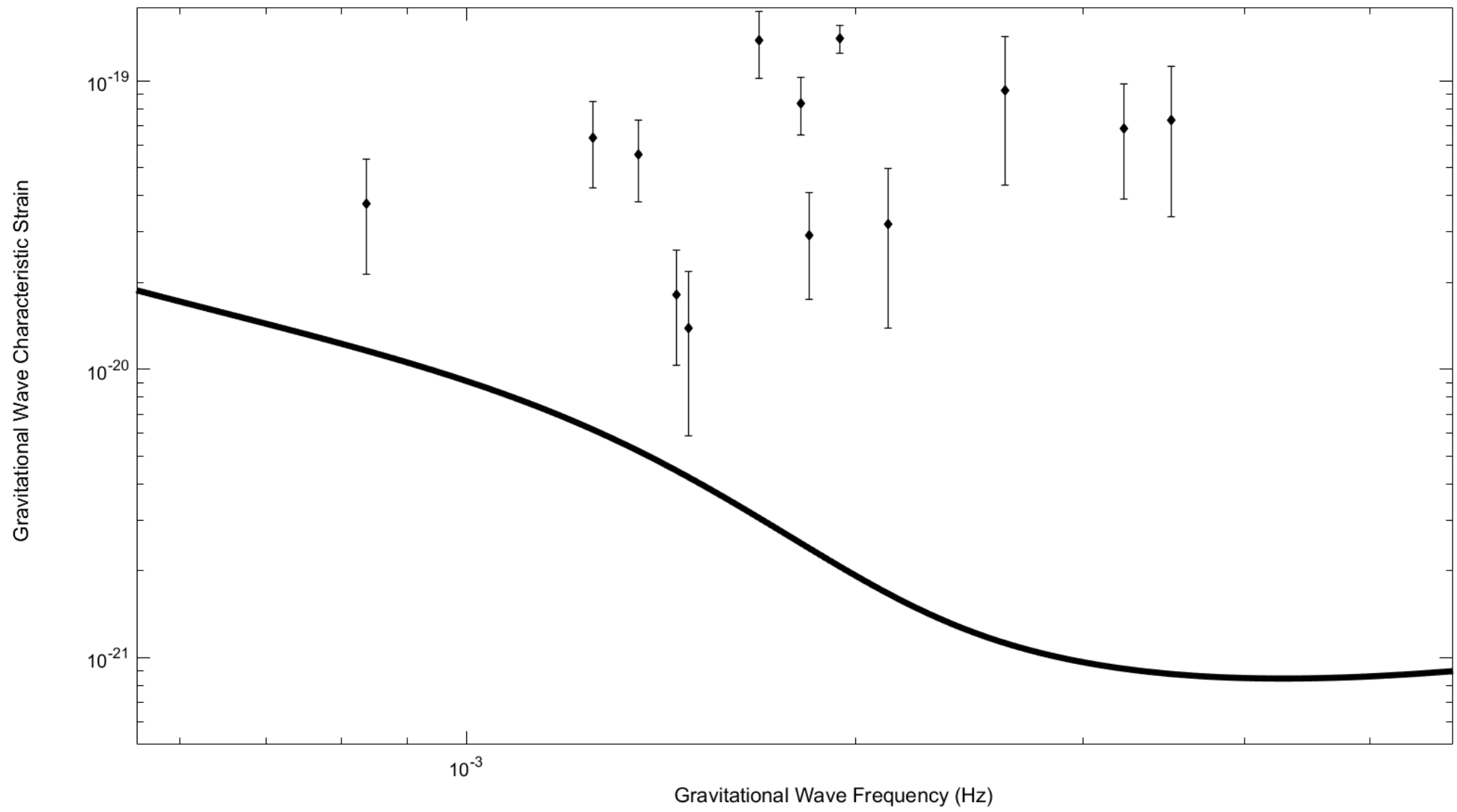


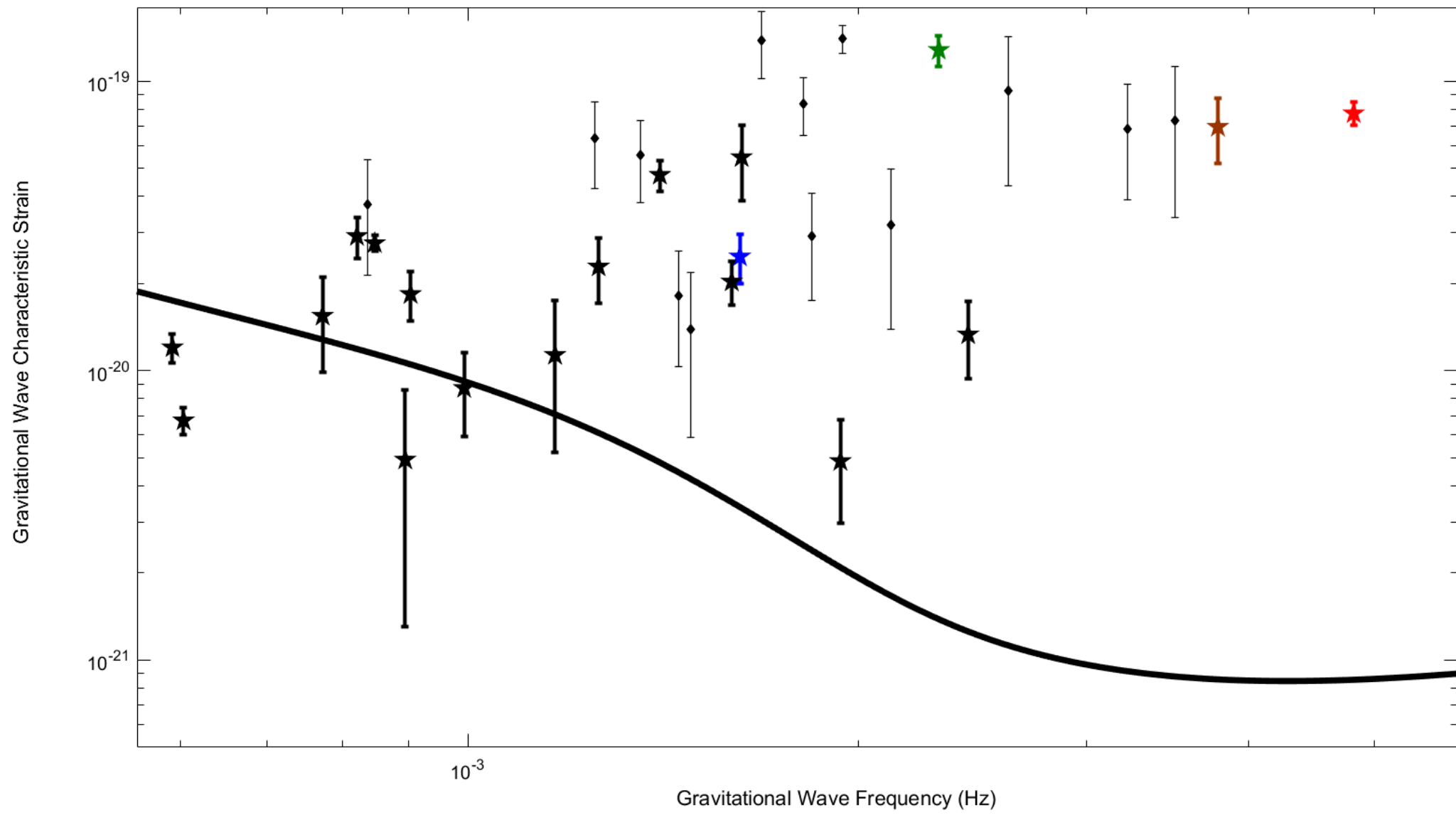
Okay, now let's get to the good stuff

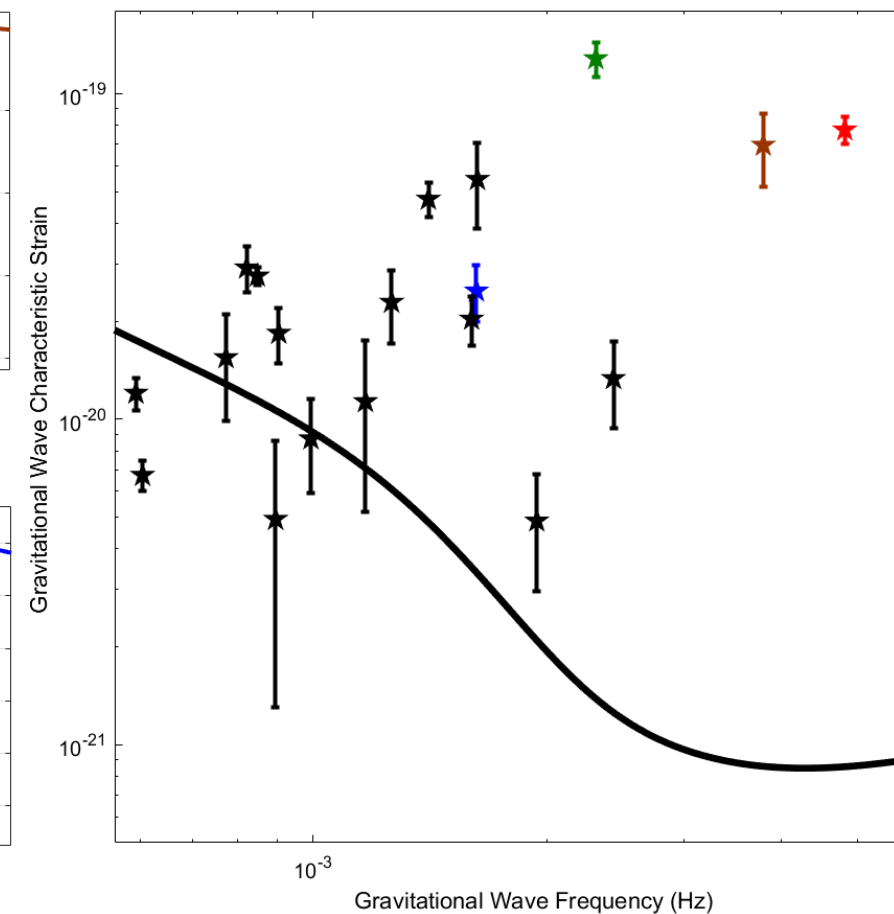
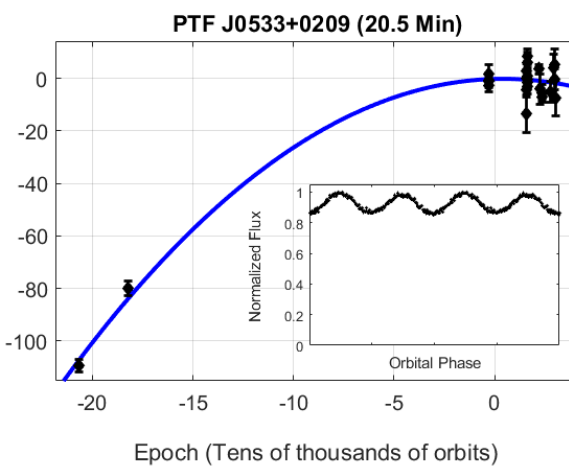
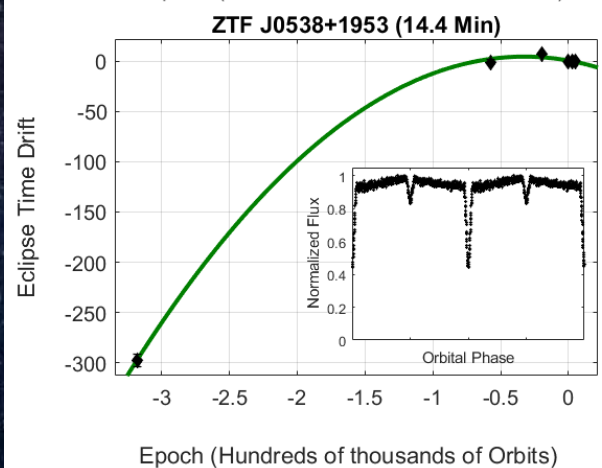
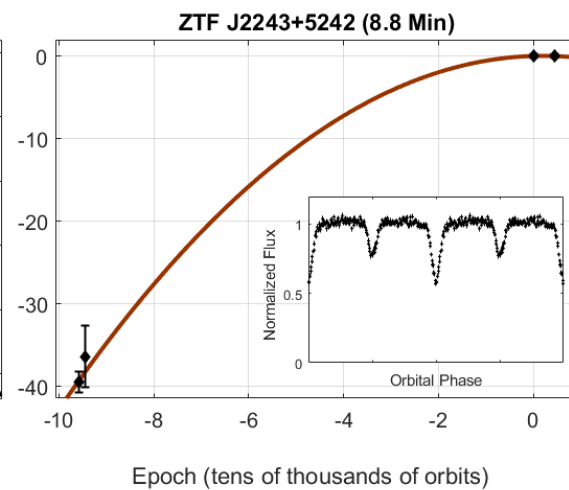
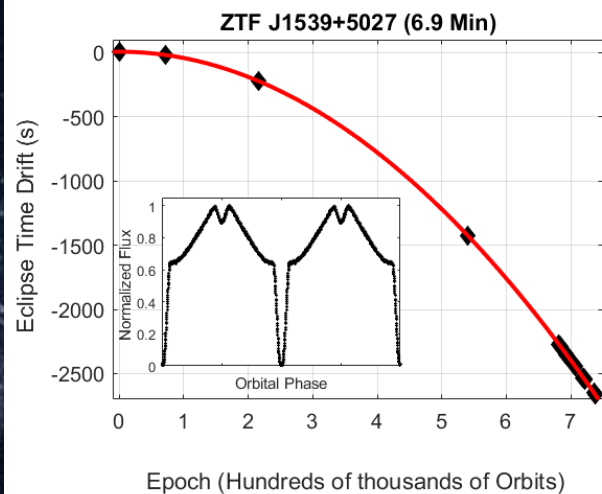


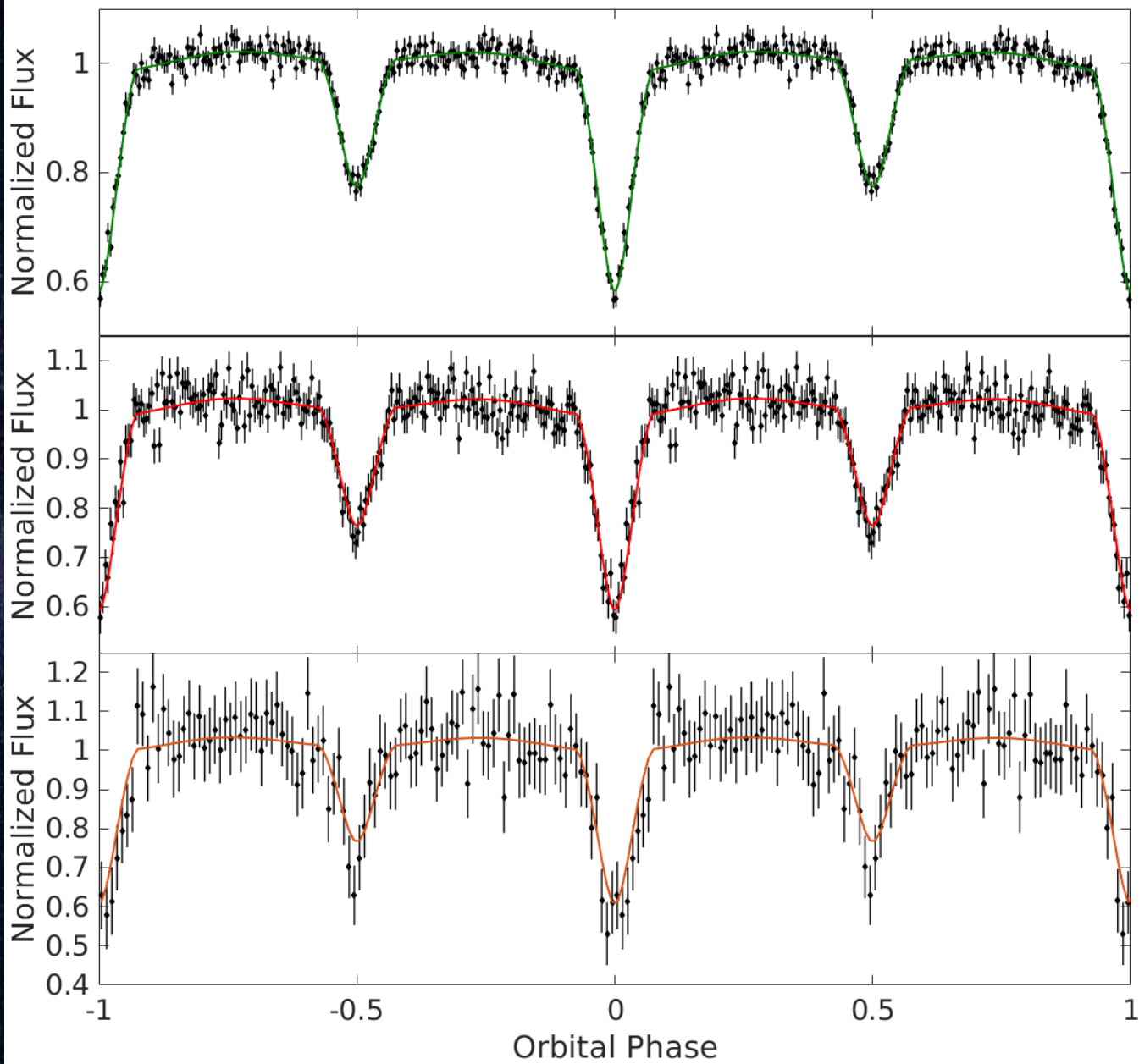
10/22/2020

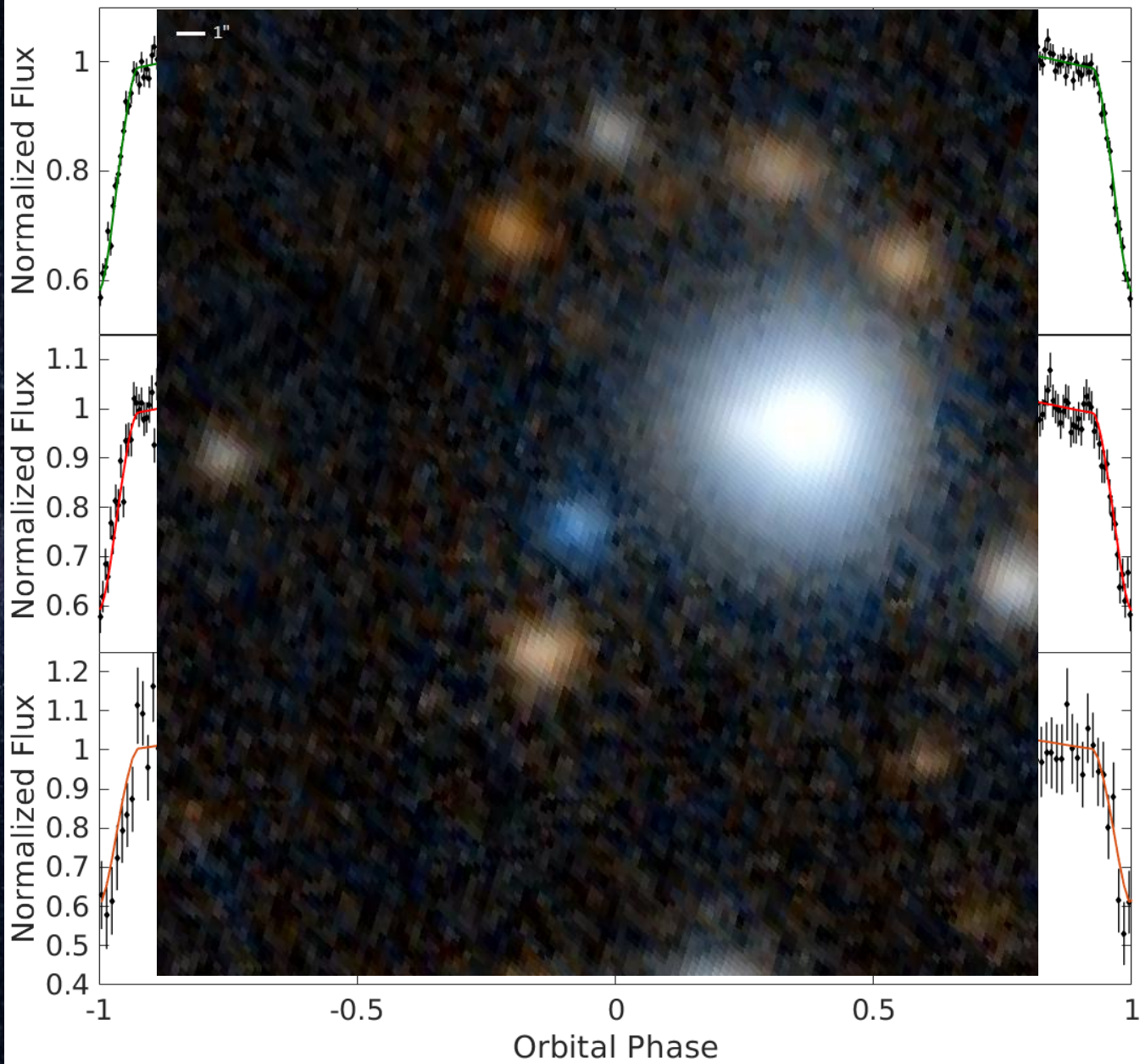




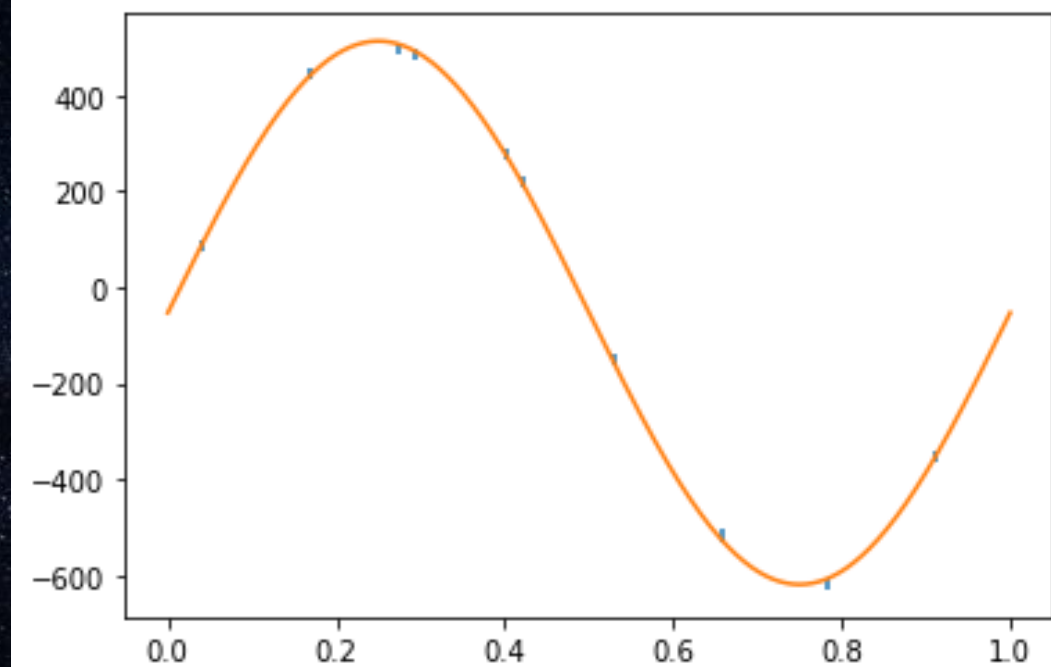
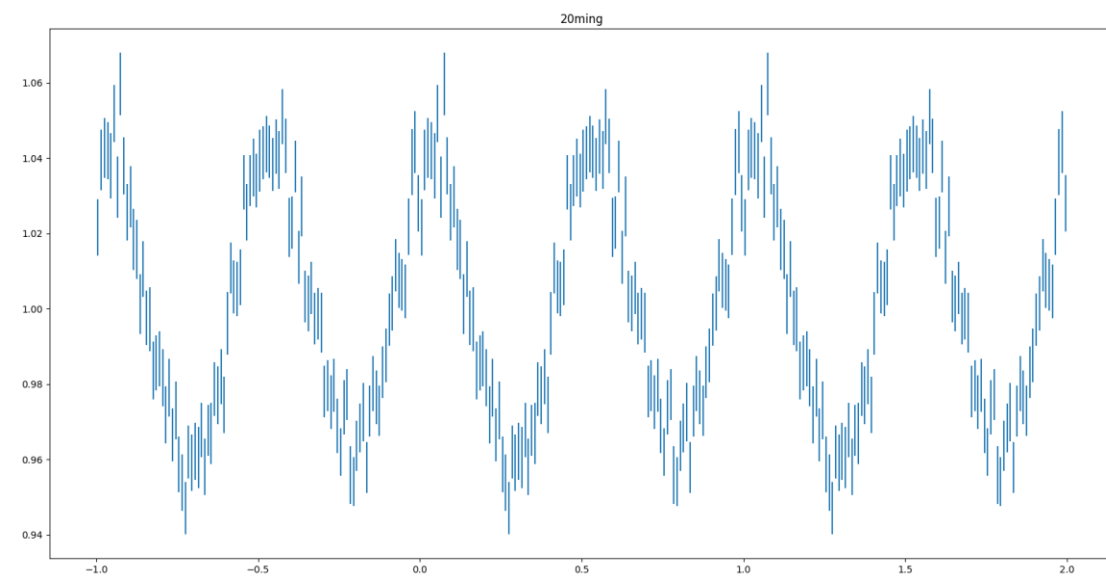


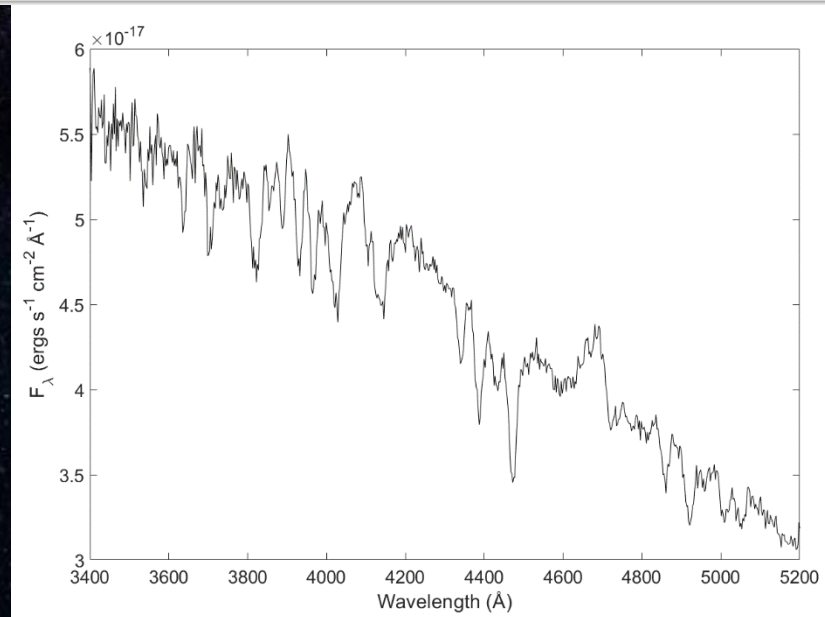
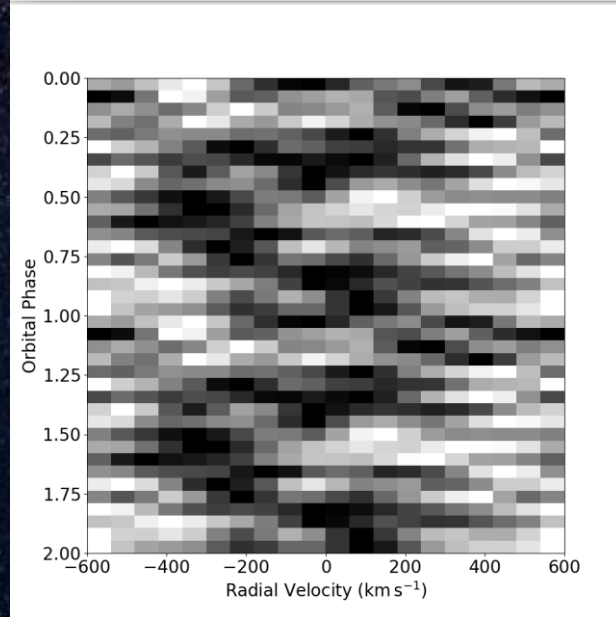
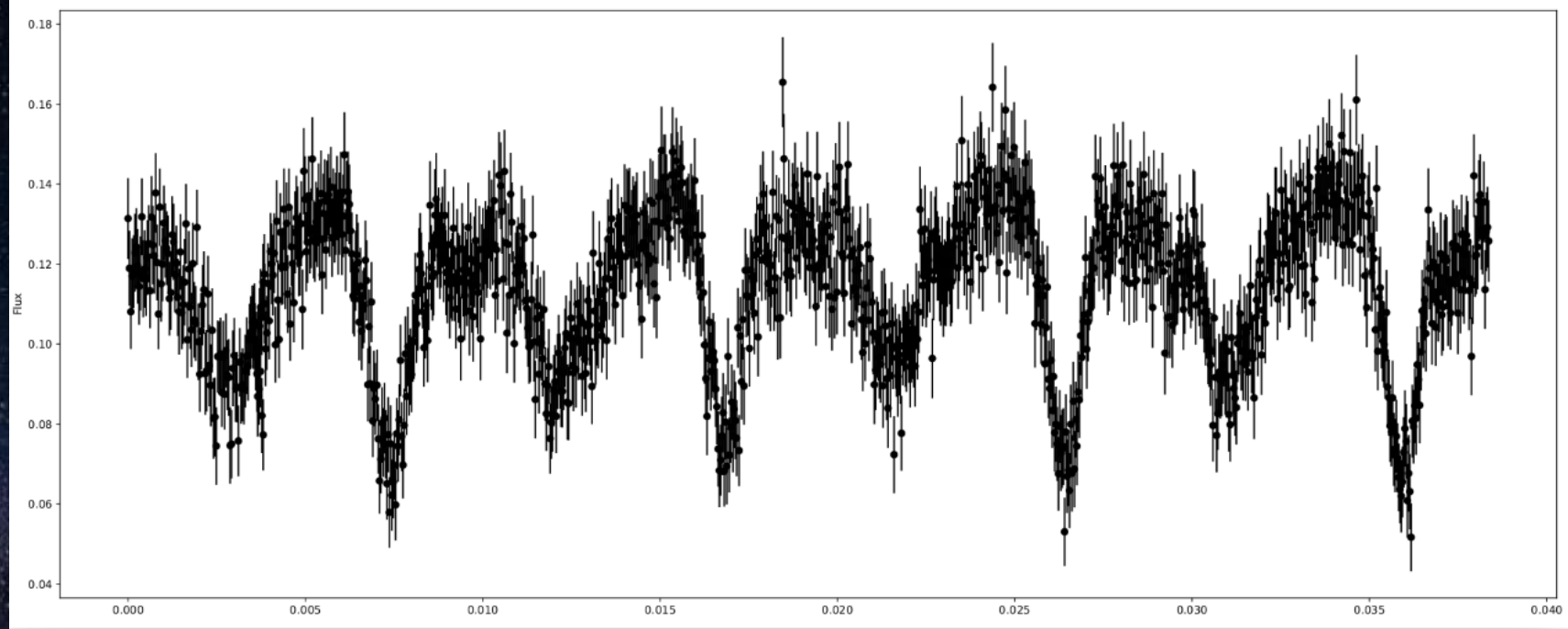






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Looking to the future

1. In phase II, ZTF will accumulate enough epochs to start discovering variables with very narrow temporal features, such as eclipsing double CO WD pairs
2. ZTF's baseline is sufficiently long to begin measuring pdots directly from ZTF data. This also means we need to begin conducting acceleration searches in order to identify the shortest period variables
3. ZTF has a lot of room to improve in its archival photometry. Forced difference image photometry could hugely increase its discovery potential. Currently, non-detections are being omitted from archival data.