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Using millisecond pulsars to measure XMM-Newton clock drift

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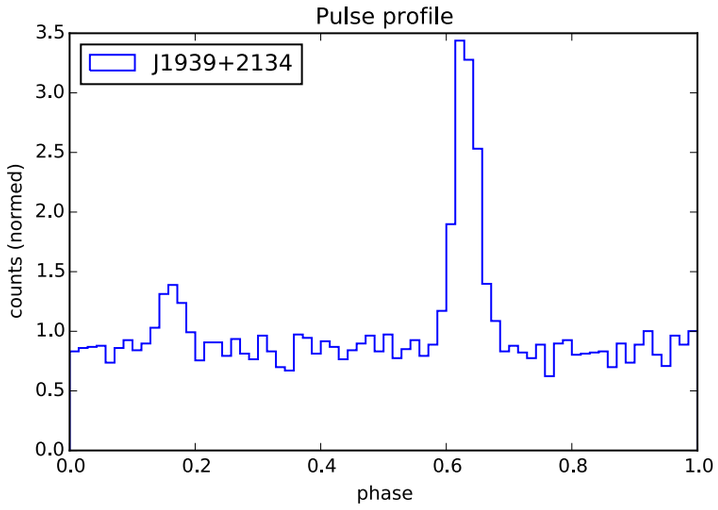
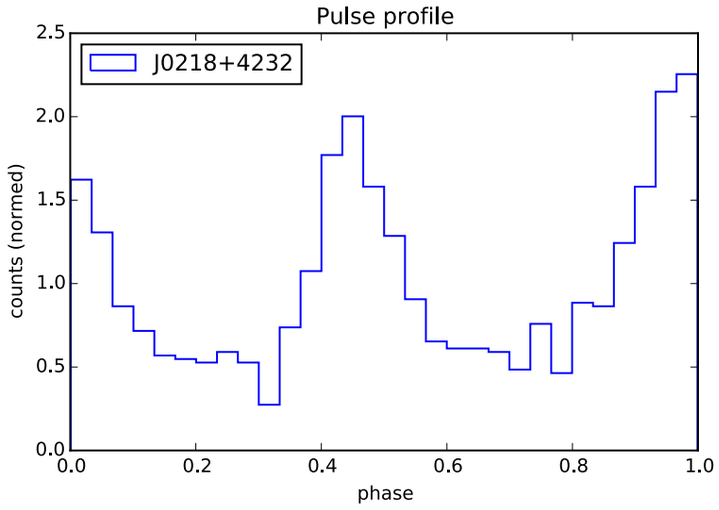
1. Motivation

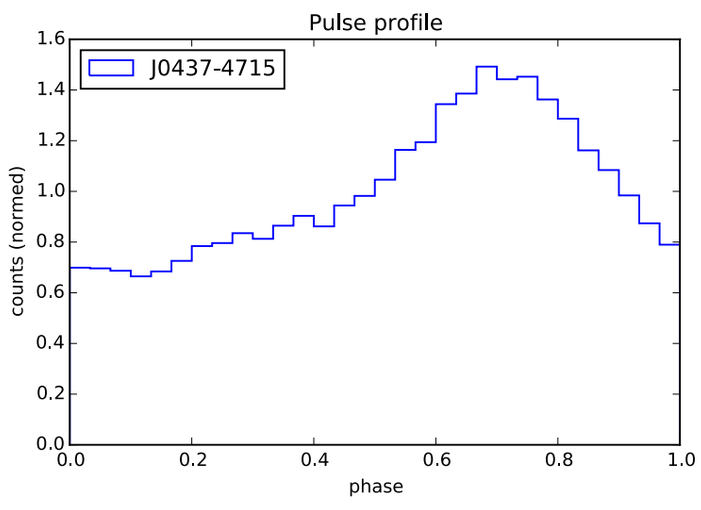
- **XMM-Newton clock drifts, for example due to changes in temperature**
- **A well-established clock stability is crucial for pulsar timing experiments**

2. Data

XMM-Newton data summary			
Object	Frequency (Hz)	Observation ID	Observation duration
PSR J0437-4715	173.687946184768	0603460101	129385
PSR J0218+4232	430.4610663457	0111100101	37819
PSR J1939+2134	641.928233642	0605370101	66920



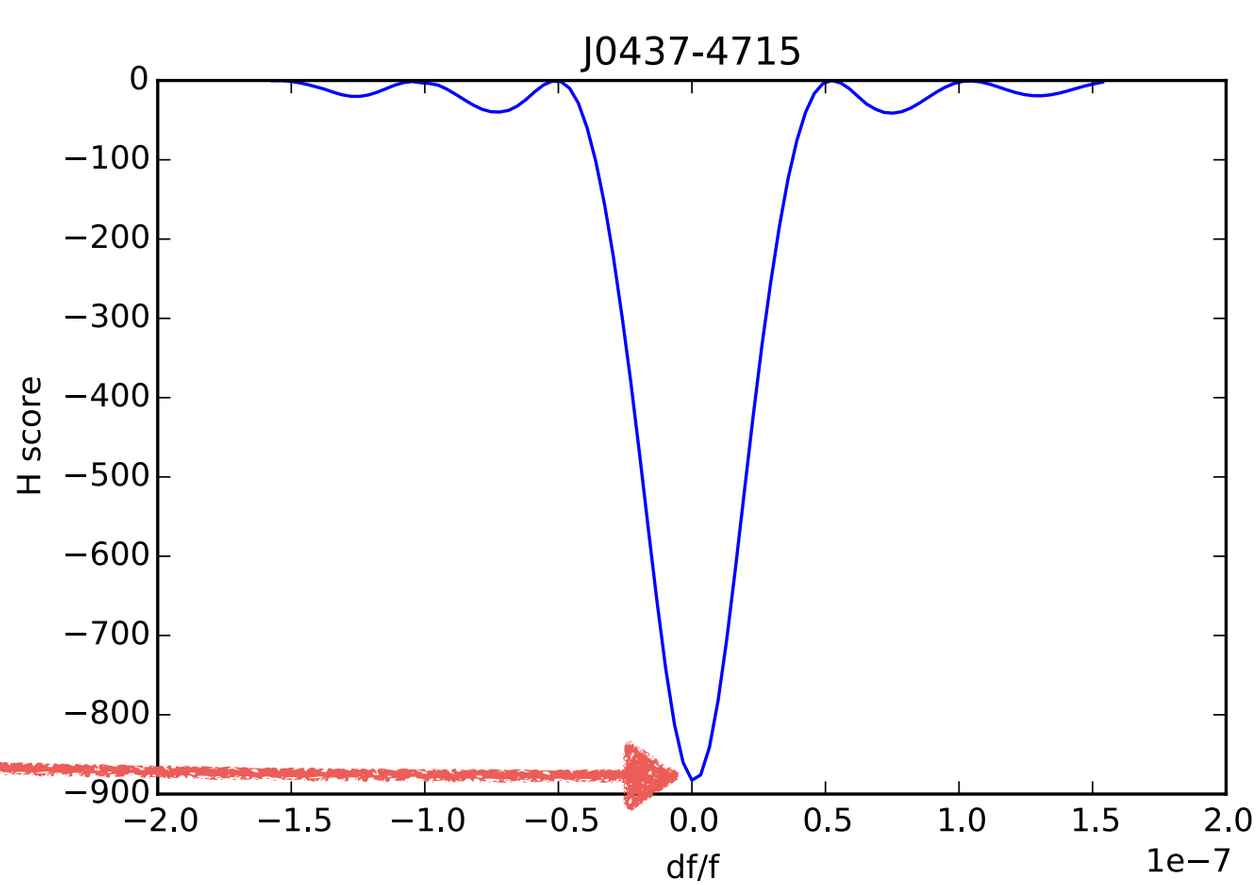




3. Method

- **Statistical H-test used to plus minimization methods used to measure clock drift**

If no clock drift (and infinite nº of photons are available) then the minimum should be exactly at zero



4. Results

XMM-Newton clock drift summary	
Object	Clock drift $(\frac{df}{F})$
PSR J0437-4715	$< 2.8 \times 10^{-9}$
PSR J0218+4232	$< 8 \times 10^{-8}$
PSR J1939+2134	$< 1.87 \times 10^{-8}$