

Predictions for high-frequency quasi-periodic oscillations with LOFT

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in collaboration with

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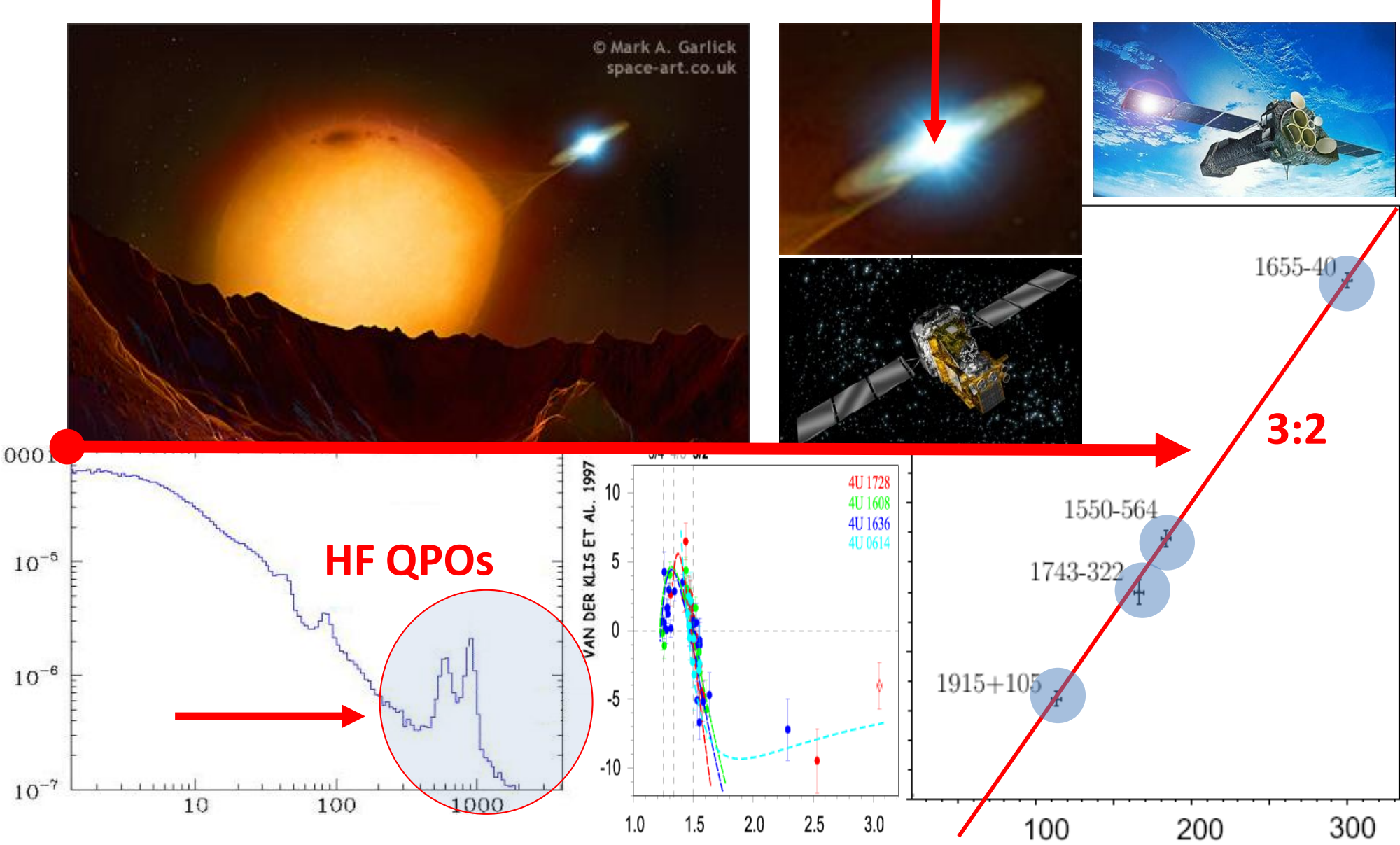
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Andrea Kotrlová,² Devaky Kunneriath,¹

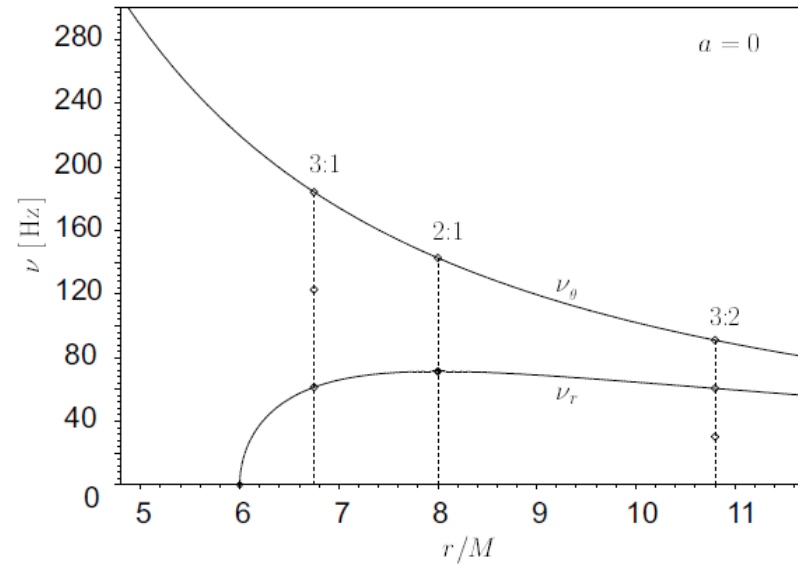
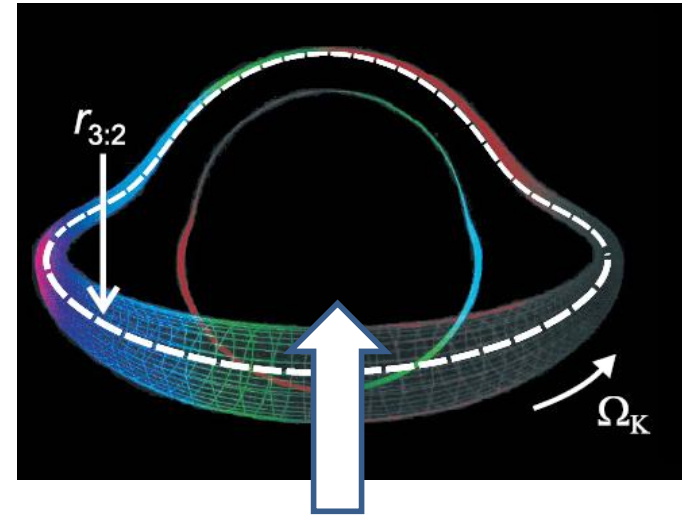
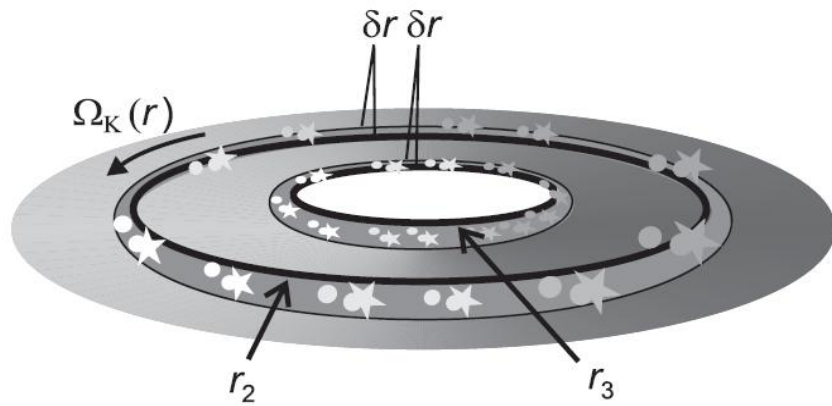
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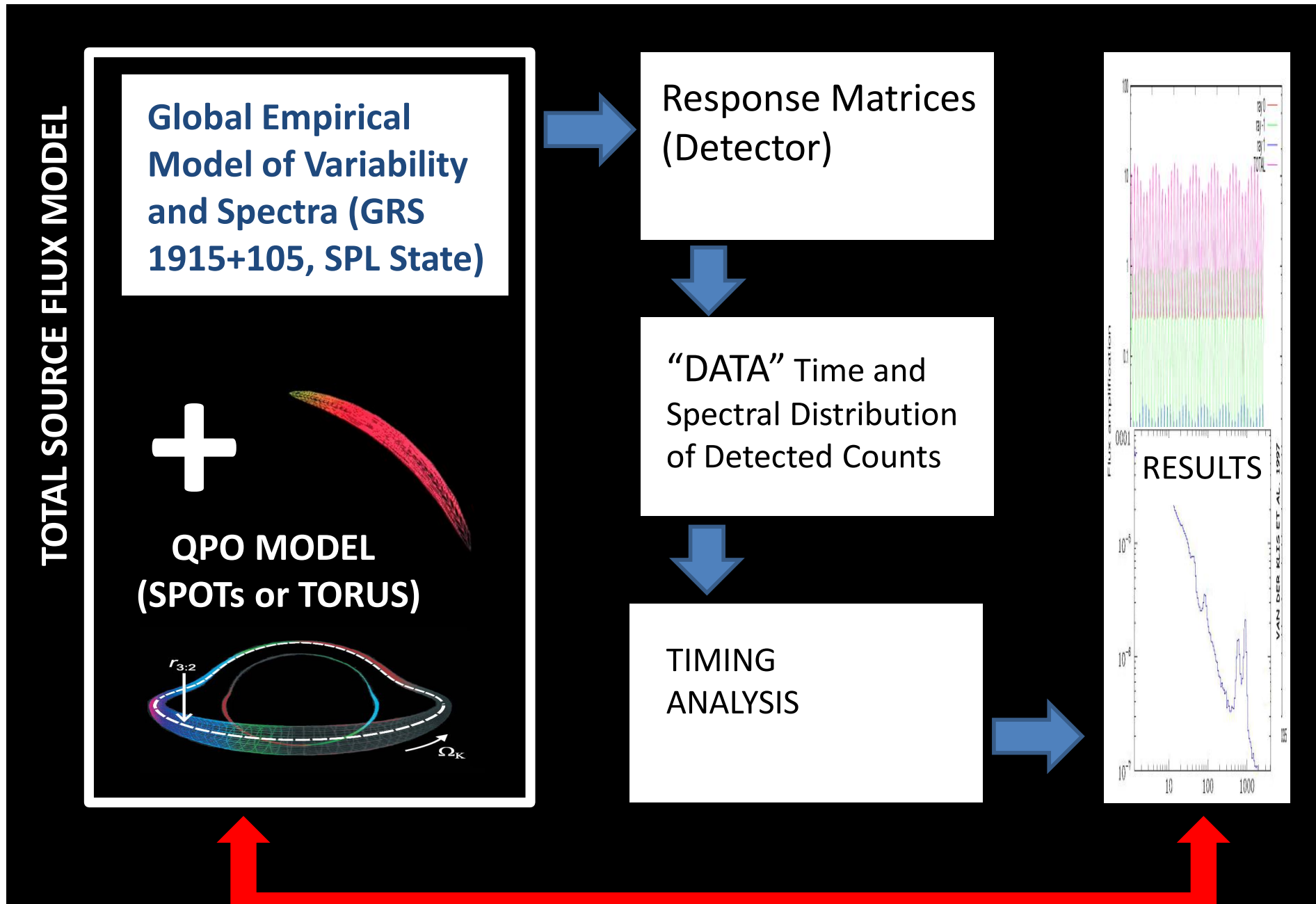
1. Introduction: LMXBs, quasiperiodic oscillations, HF QPOs



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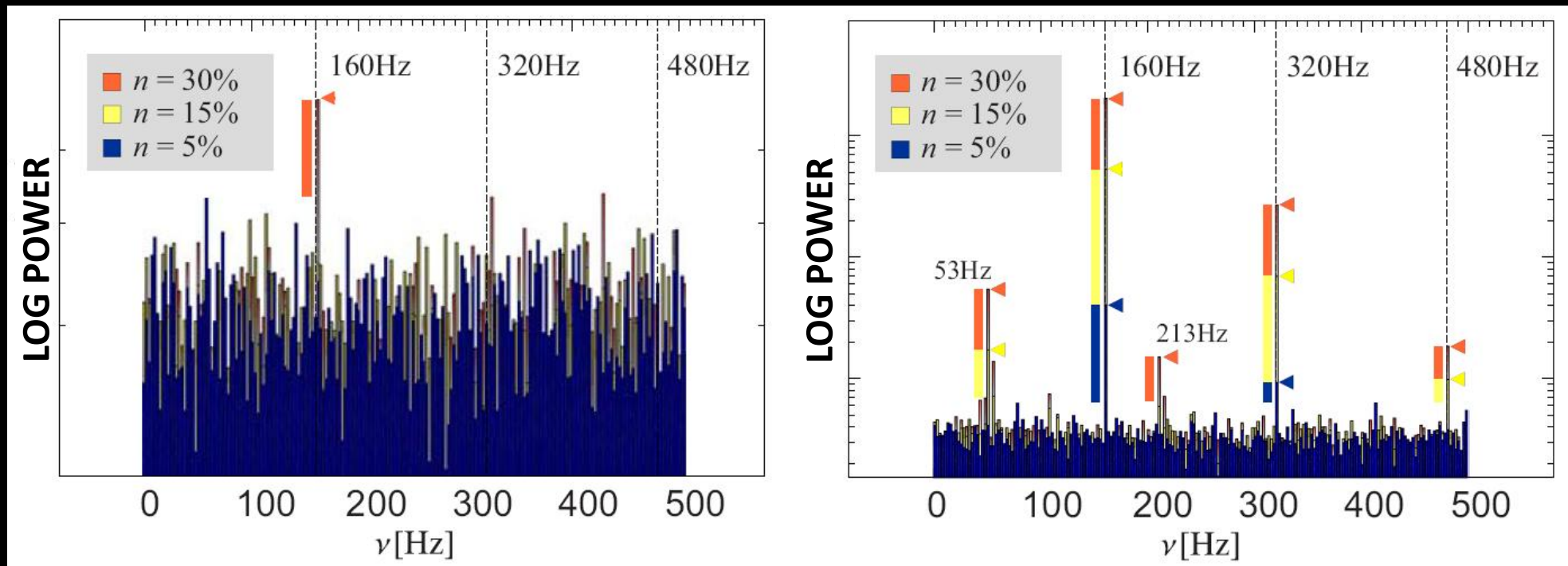


3. Observable signal from ER tori and spots (RXTE vs. LOFT)



3.1 Spots – harmonic content of the signal

Small spots moving along slightly eccentric orbits close to ISCO



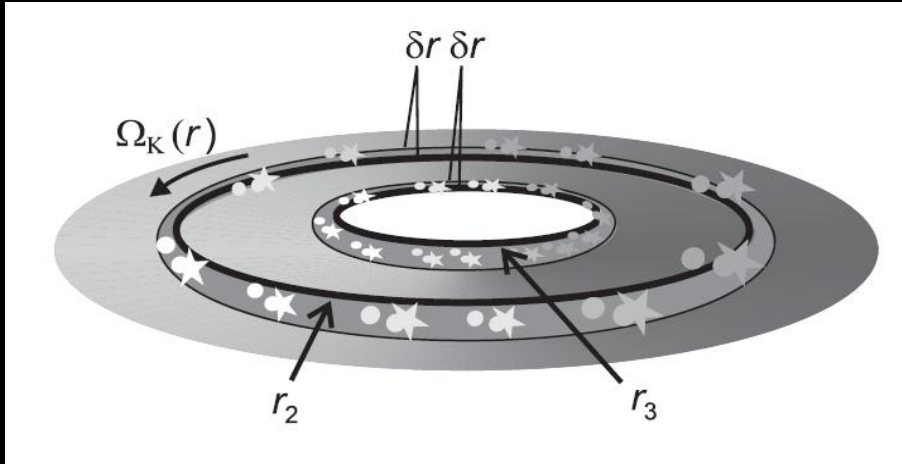
Left: RXTE

Right: LOFT

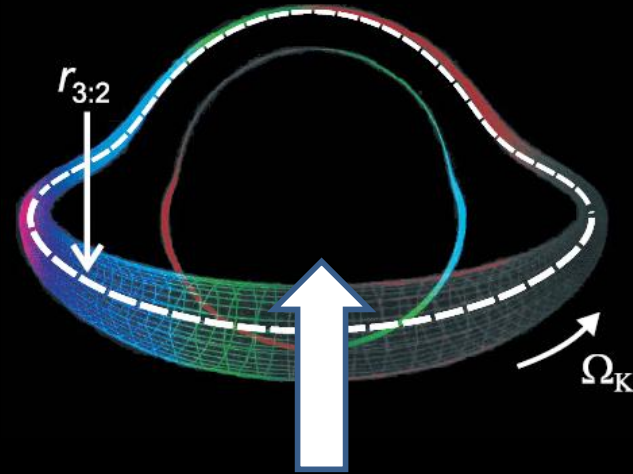
Bakala et al., 2014, MNRAS

3.1 Spots vs. tori (comparison between specific models)

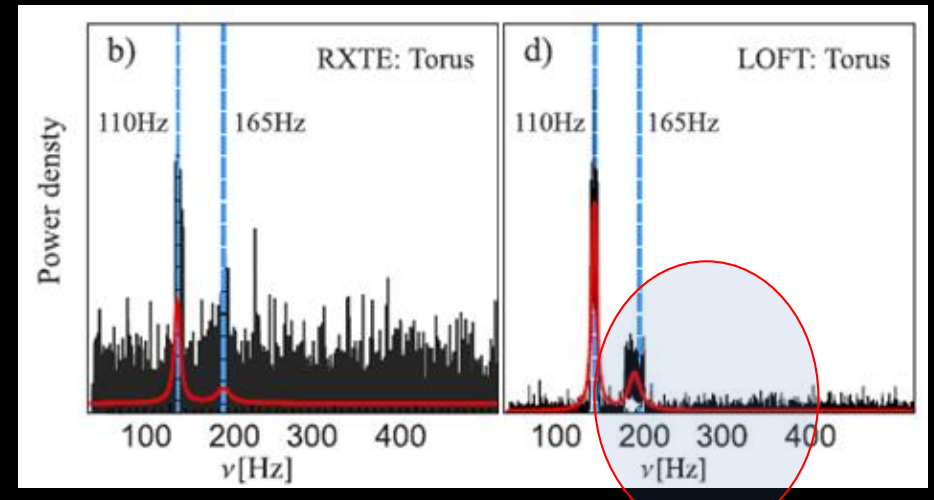
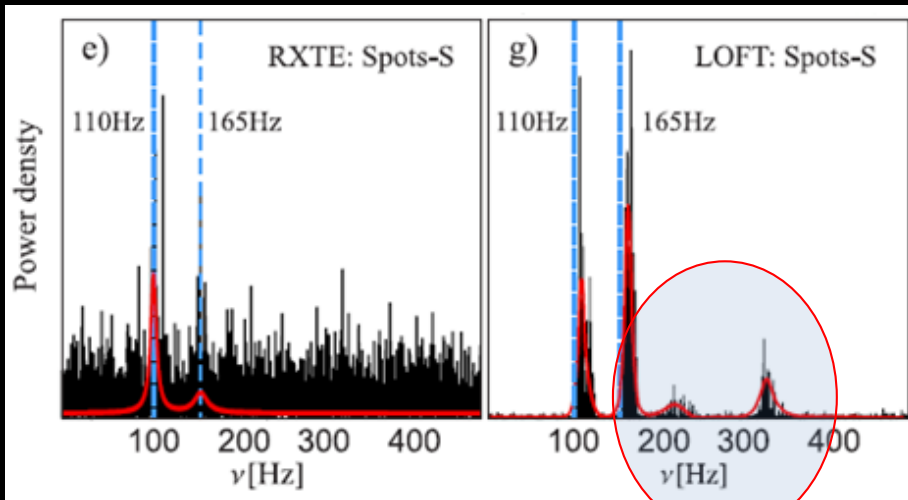
Toy models of double peak QPOs assuming preferred orbits



Drifting spots



Drifting ER tori (opt. thin)



Harmonic content...

4. Exploring signal from tori and spots with LOFT: Summary

- **Epicyclic resonance model:** predicts that individual sources with a moderate spin should exhibit a smaller spread of the measured 3:2 QPO frequencies than sources with a near-extreme spin (GRS-1915+105) or superspinars. Verification of this prediction requires large amount of high resolution data obtained with LOFT.

[Kotrlová et. al 2014, A&A; Šrámková et al. 2014, A&A, submitted]

- **Spots:** The harmonic content of the circular spot signal should be clearly recognized using LOFT observations.

[Bakala et. al 2014, MNRAS, see also poster of Karas et al. here]

- **Spots vs. Tori:** Specific model signatures such as harmonics unresolvable with RXTE can be crucial. Good examples of LOFT capabilities (although specific models):

- e.g., circ. spot vs. opt. thin torus X elongated spot vs. opt. thick torus
- *see poster of Karas et al. (opt. thin torus) and talk of Pavel Bakala (opt. thick torus) here for more on this issues....*