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The kHz QPOs in 4U 1636-53

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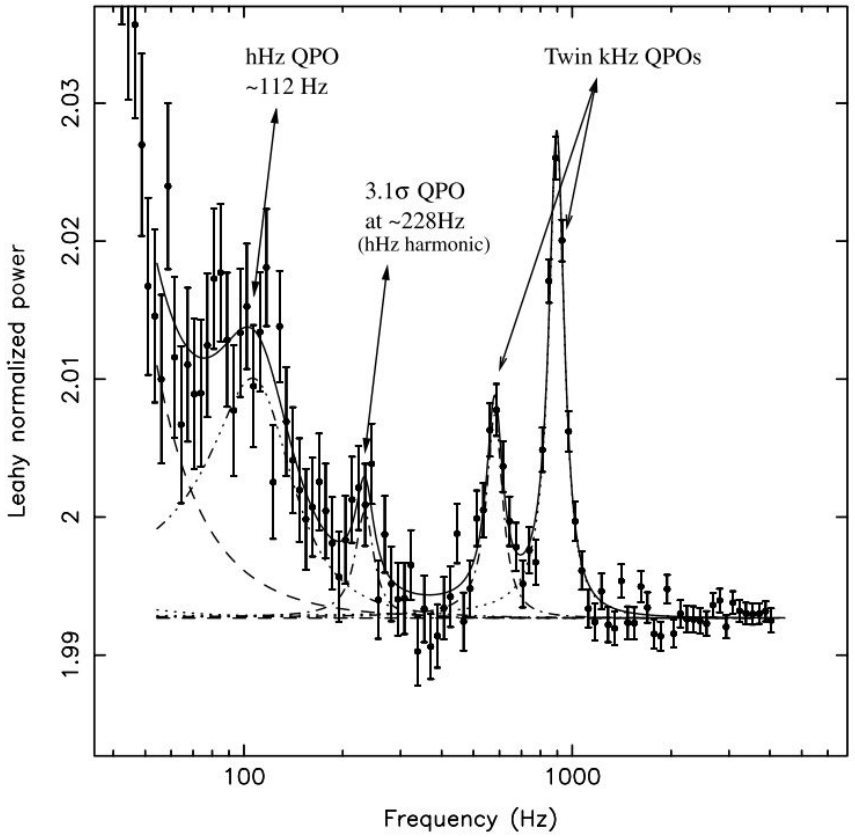
Conselho Nacional de Desenvolvimento Científico e Tecnológico

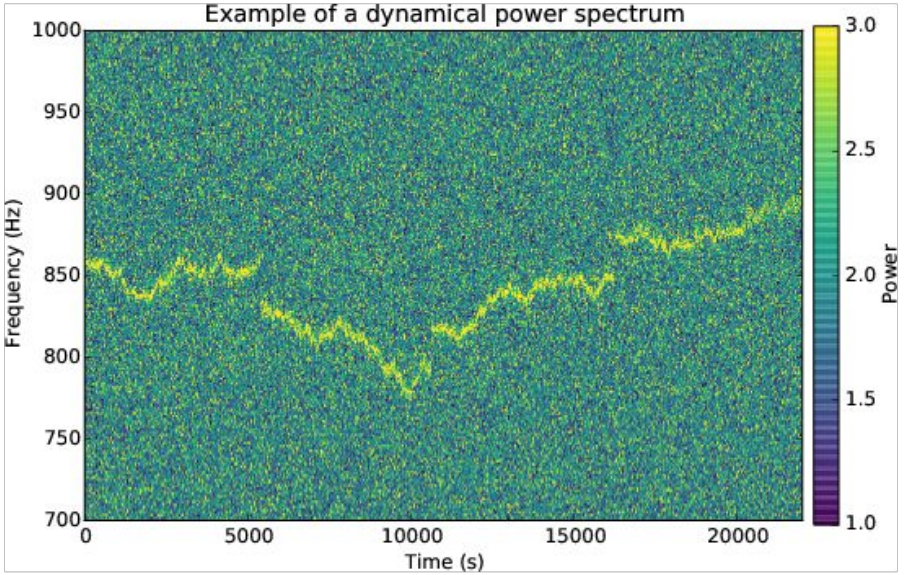
SCIENCE WITHOUT BORDERS

Thank you :)

Kilohertz **q**uasi-**p**eriodic **o**scillations

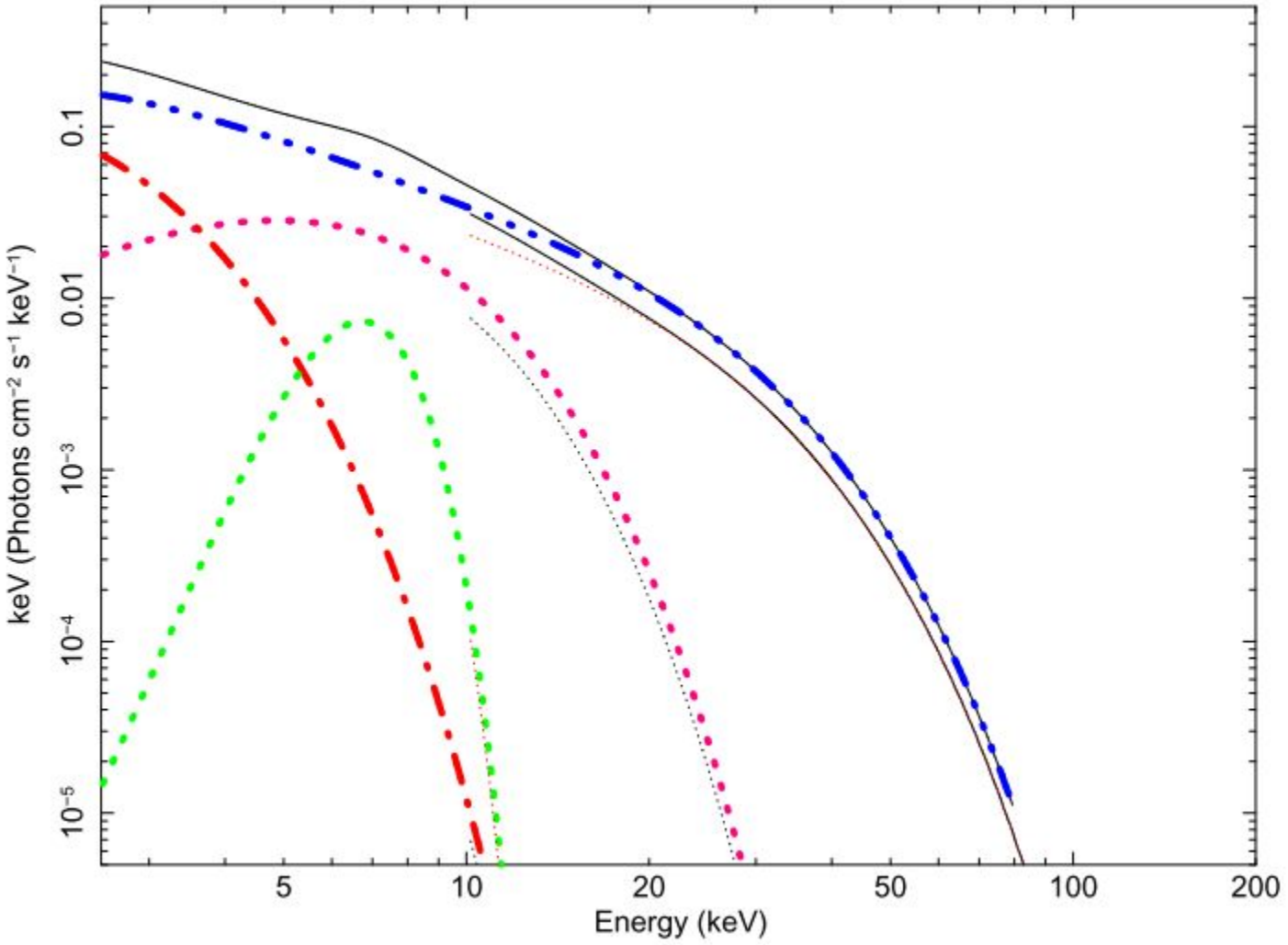
Fig: Altamirano et al. 2008





Energy spectrum

Fig: Zhang et al. 2017



QPO amplitude vs photon energy

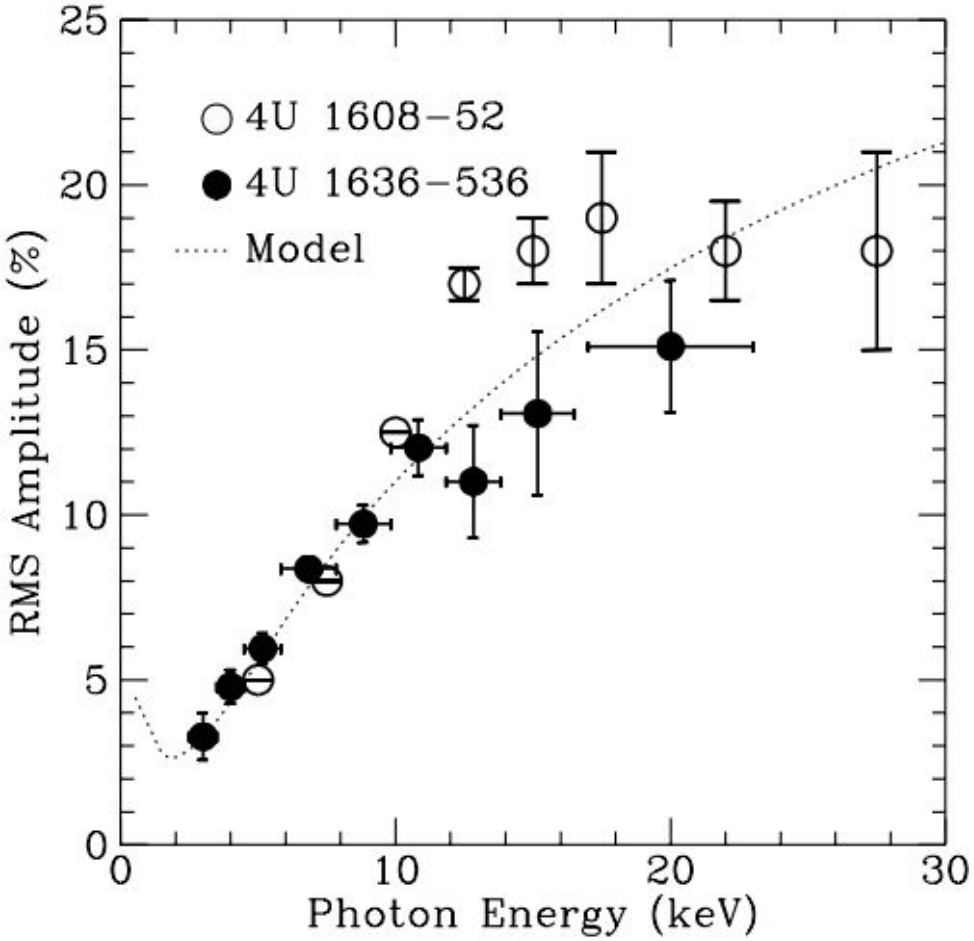
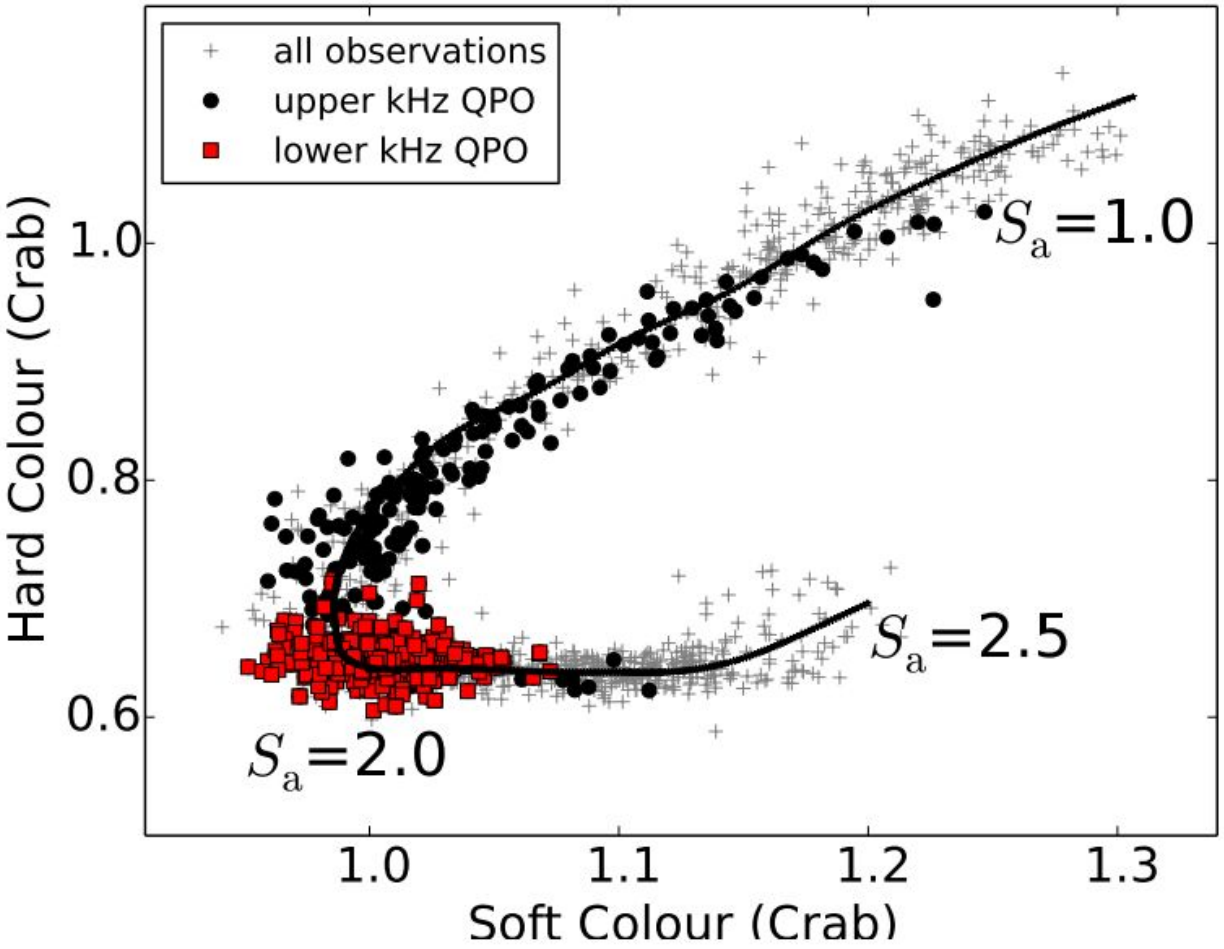


Fig: Miller et al. 1998

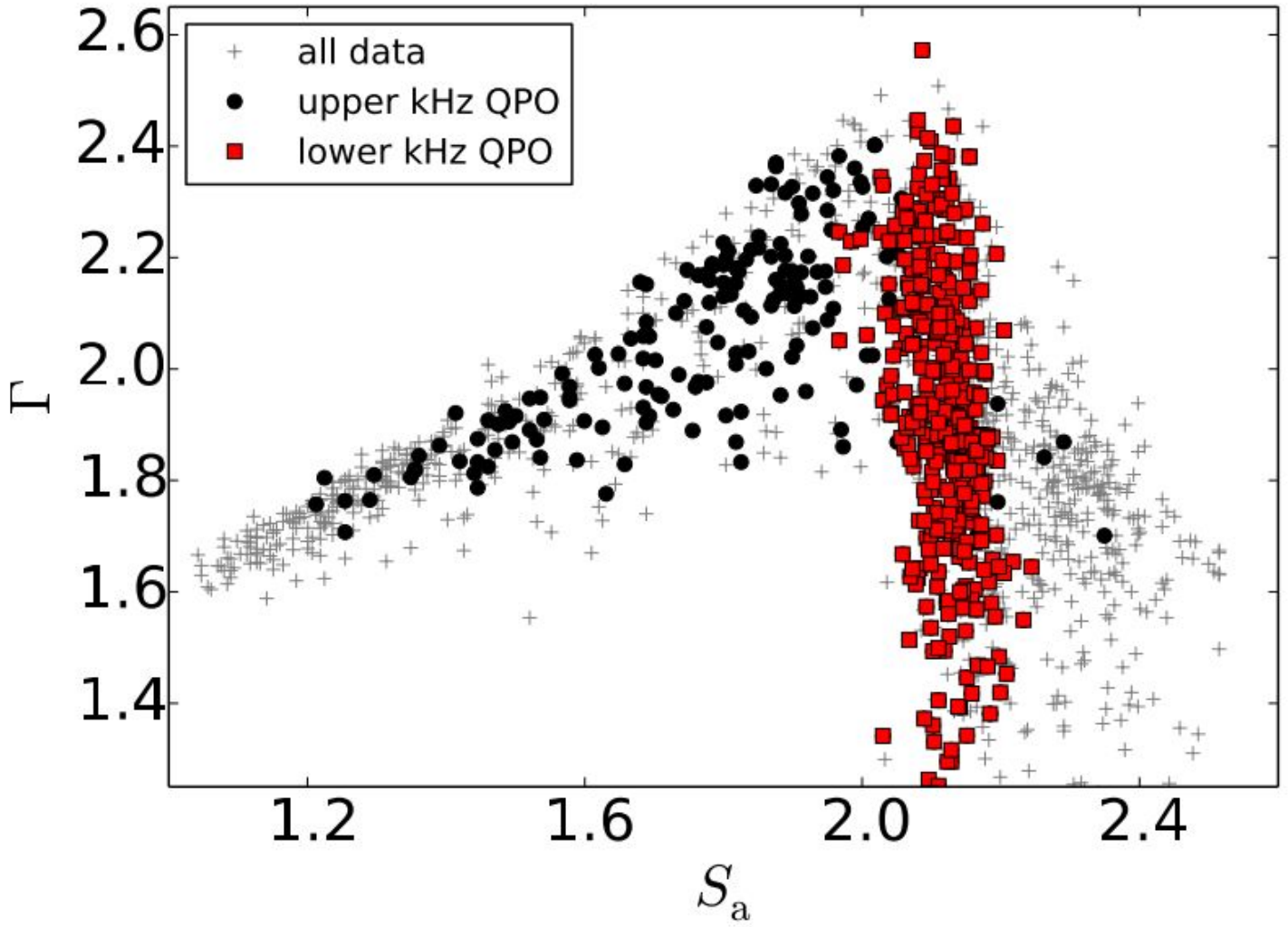
Spectral evolution

Fig: Zhang et al. 2017



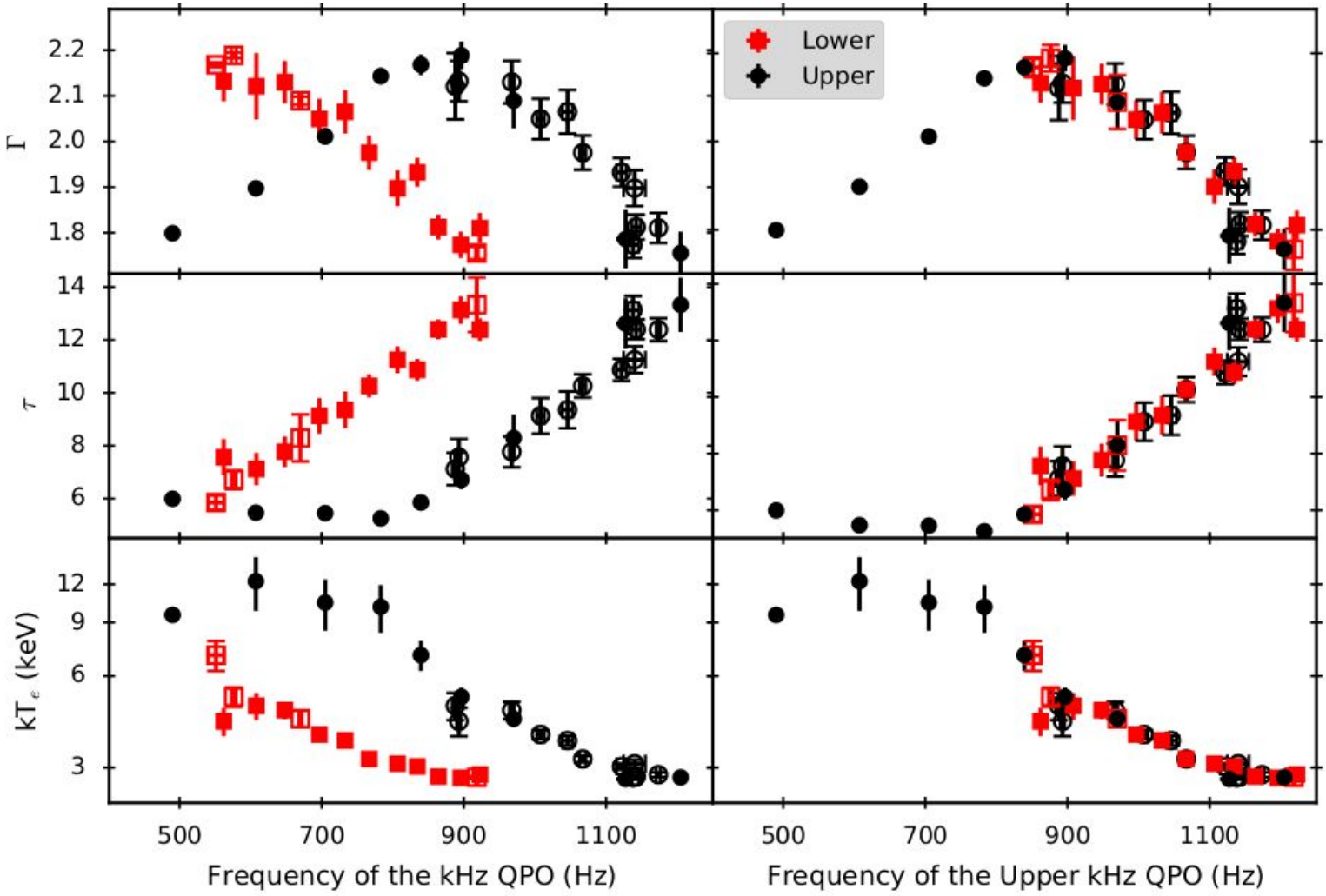
Spectral properties and the presence of kHz QPOs

Fig: Zhang et al. 2017



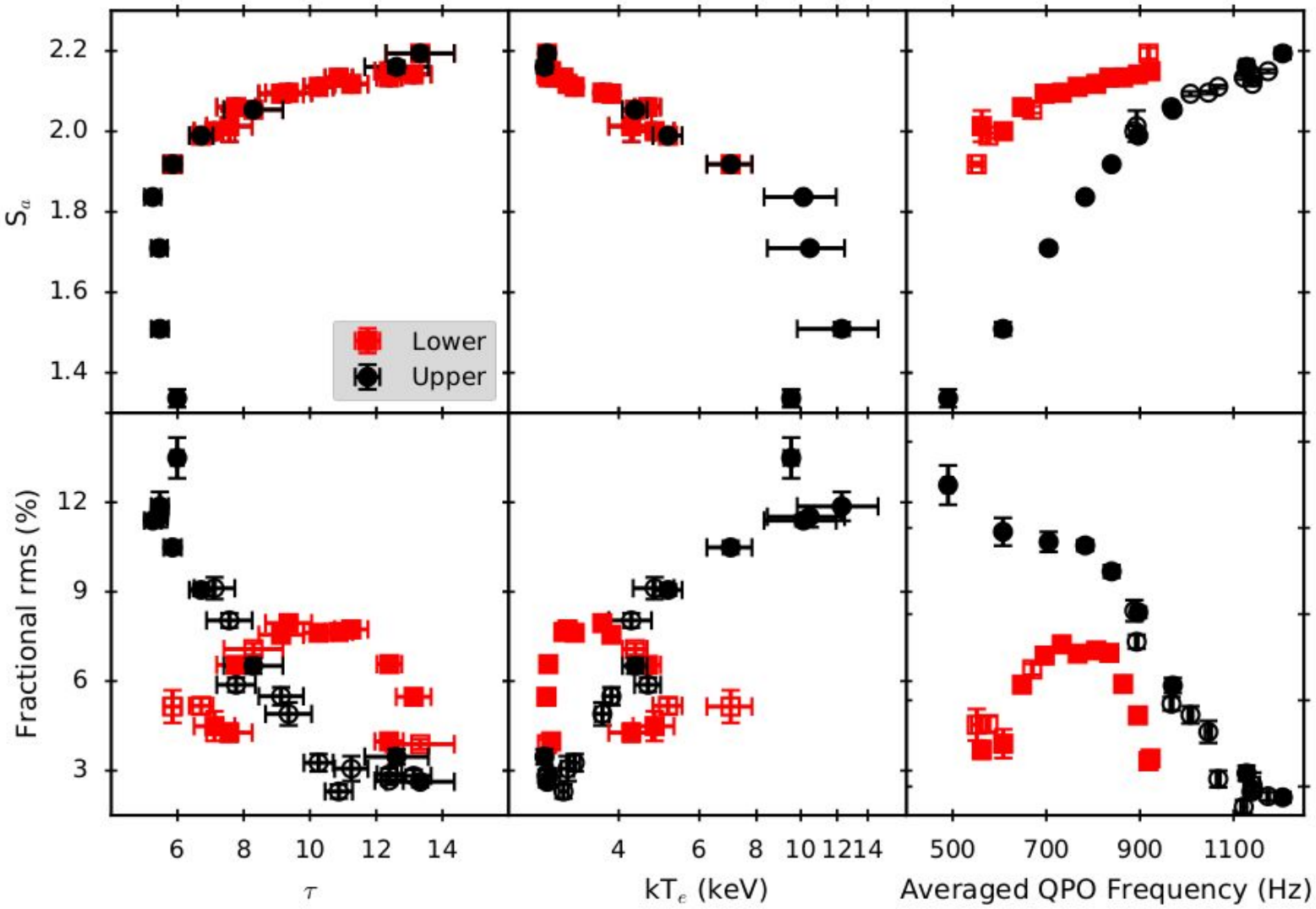
Spectral properties vs QPO frequency

Fig: Ribeiro et al. 2017a (almost submitted)



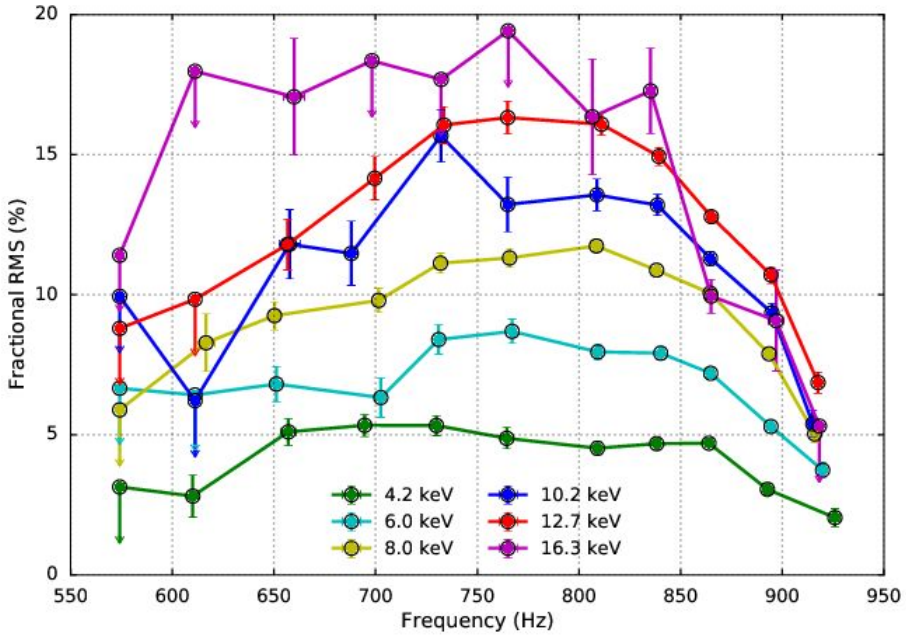
Spectral properties vs QPO amplitude

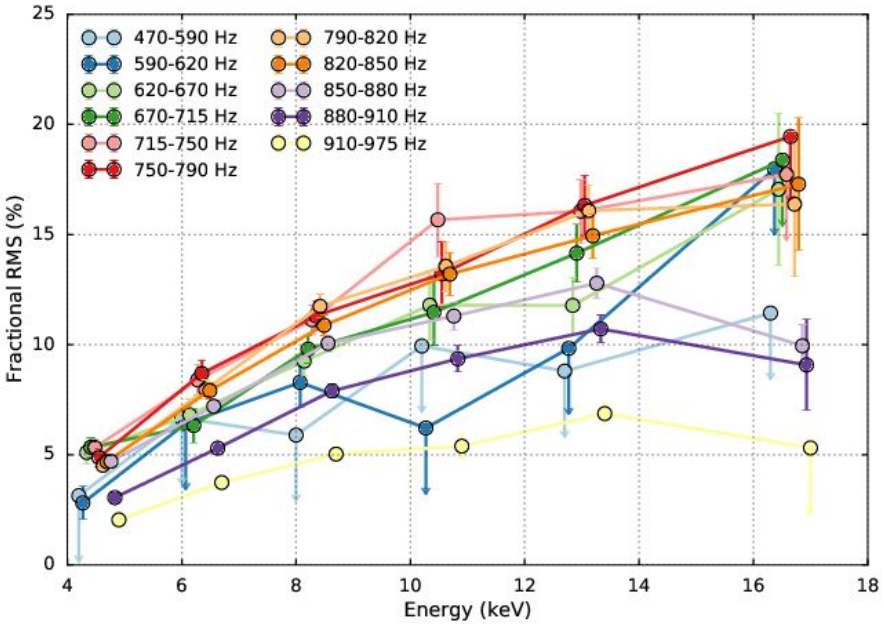
Fig: Ribeiro et al. 2017a (almost submitted)



Amplitude per frequency and per photon energy

Fig: Ribeiro et al. 2017b (in prep.)





Take home messages

- The lower kHz QPO only appear at specific spectral state.
- The frequency of both QPOs (dynamic mechanism) are related to the spectral parameters by the same relation.
- The amplitude of the lower and upper kHz QPOs (radiative mechanisms) shows completely different relation with respect to the spectral parameters.
- The increase of fractional rms amplitude with energy is different for different QPO frequencies (we are investigating how much).