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Quasi-Periodic Oscillations are more than just frequencies

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Quasi-periodic oscillations (QPO) are an important probe of the timing properties of black-hole binaries and a ubiquitous feature of their PDS. For that reason, many attempts to explain their origin have also reduced them to their frequencies. In order to explore their behavior beyond this, we consider three simple classes of models: elongated hot spots, tori and spirals. We perturb the equilibrium temperature of a thin disk to create these structures. The perturbed disk is supposed to emit blackbody radiation at the local temperature. Radiation is ray-traced in the Schwarzschild metric to a distant observer.

We then studied different timing AND spectral features of those models, such as the impact of inclination, how the rms evolves with frequencies, and the impact on the spectral fit; showing how characteristics beyond the frequency could be used to differentiate between models.

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