

## **Linking the Disc and Corona through Quasi-Periodic Oscillations in Mrk 530**

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Active Galactic Nuclei are powered by supermassive black holes that feed on matter and release enormous energy across the electromagnetic spectrum. Studying their variability helps us understand how matter behaves in extreme gravity. In 2018, the Seyfert galaxy Mrk 530 showed an interesting result when quasi-periodic oscillations were detected at the same time in both X-ray and ultraviolet light. Quasi-periodic oscillations are repeating signals in brightness that are thought to arise from instabilities or oscillations in the flow of matter close to the black hole. Their detection in two energy bands together is rare in active galaxies and provides important clues about the structure of the central region. Our analysis suggests that changes in the accretion rate first affect the outer regions, producing ultraviolet variations and then move inward to the hot corona, where they create the X-ray oscillations. This shows that the disc and corona are physically connected and that their interaction can generate coherent signals across different wavelengths. The 2018 result from Mrk 530, therefore, provides new evidence linking short timescale variability in active galaxies to the physics of accretion flows around supermassive black holes.