

Abstract Submitted
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Twin-Peak Quasi Periodic Oscillations and Tri-dimensional Spiral Modes of Disks Around Black Holes* P. REBUSCO, B. COPPI, MIT — Existing explanations of high frequency Quasi Periodic Oscillations (QPO's) from compact objects have shortcomings [1] that a theory based on the excitation of tri-dimensional spiral modes [2] co-rotating with the plasma near a black hole can avoid. The modes that are likely to prevail, with the largest growth rates, are localized relatively close to the last stable orbit (a.k.a. ISCO). The modulation of the radiation due to the rotating plasma density enhancements associated with the spirals and reaching the observer, is evaluated by an appropriate extension of existing analyses [3] developed for a rotating "hot spot" model. As a result of relevant non-linear decays, the lowest harmonics $m_\phi = 2$ and $m_\phi = 3$ of the considered spiral modes (where m_ϕ is the toroidal mode number) are envisioned to acquire the largest amplitudes justifying the observed 3/2 ratios of the two peaks of the frequency spectra of high frequency QPO's. *Sponsored in part by the U.S. D.O.E and the Pappalardo Fellowship.

[1] B. Coppi and P. Rebusco, Paper P5.154, E.P.S. Inter. Conf. (Crete, Greece, 2008).

[2] B. Coppi, Paper P1.177, E.P.S. Inter. Conf. (Crete, Greece, 2008).

[3] J. D. Schmittman and E. Bertschinger, Ap. J. **606**, 1098 (2004).

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