

S06a **Broad emission line profiles of rotating disks around binary supermassive black holes in SDSS quasars**

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The existence of unusual double (or multiple) peaked broad line objects has been successively reported recently by the Sloan Digital Sky Survey (SDSS). Two main theoretical models have been so far proposed; namely, the double peaked nature of broad line regions can be explained either (1) by the motion of the rotating disk around a supermassive, single black hole or (2) by the superposition of the emission from broad line region around each black hole in a binary black hole system.

In this paper, we propose a third model as described below. We consider the emission line profiles of two rotating disks, each rotating around each of black holes in a binary black hole system. Due to the tidal interaction, the disk around the primary (more massive) black hole becomes eccentric, if the black hole mass ratio is approximately less than 0.3. Therefore, the resulting line profiles show periodic variations due to the binary orbital motion and precession of the disk. This will explain the the unusual double (or multiple) peaked features in SDSS quasars. We will report how the disk is deformed and how line profiles vary with time. We will also discuss the comparison with the observed broad line profiles.