Abstract Submitted
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The black hole mass in NGC 4258 from gas kinematics[1] DAVID DECOLIBUS, JASON PINKNEY, Ohio Northern University — NGC 4258 (or M106) is an important galaxy for the demographics of supermassive black holes (SMBH). Radio (VLBA) observations of its nuclear disk of water masers has allowed a very precise estimate of the mass of the central SMBH ($3.82 \pm .01 \times 10^7 M_\odot$), and the distance to the galaxy (7.2 Mpc). Hubble Space Telescope (HST) archival data allow the measurement of the BH mass in two additional, independent ways: stellar and gas kinematics, thus providing a crucial test of these more widely-used methods. Here we report on progress in a re-analysis of the archival data allowing gas kinematics. These data consist of HST long-slit spectroscopy from two programs, a total of 6 slit positions. We have fitted the Hα + [NII] and [SII] lines in order to determine radial velocities and velocity dispersions as a function of distance from the BH. The gas only shows organized rotation out to $\sim 0.4''$. The Hα emission shows a broad-line (BL) component from the central AGN, and regions outside of the BL region show greater line widths than expected for a kinematically "cold" gas disk. We report initial results of modeling the kinematics as resulting from a thin, inclined disk of line-emitting gas orbiting under the influence of gravity only.

[1]Based on observations made with the NASA/ESA Hubble Space Telescope operated by the AURA under NASA contract NAS 5-26555.

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