Abstract Submitted
for the OSS16 Meeting of
The American Physical Society

The Black Hole Mass in NGC 4258 from Gas Kinematics DAVID DECOLIBUS, JASON PINKNEY, Ohio Northern University — NGC 4258 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 ($3.9\pm0.1 \times 10^7 M_\odot$), and the distance to the galaxy (7.2 Mpc). Hubble Space Telescope (HST) archival data allow the measurement of the BH mass in two independent ways: stellar and gas kinematics, providing a crucial test of these methods. Here we report on an analysis of the archival data which allow gas kinematics: STIS 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 position along the slits. We use primarily the velocities to constrain our thin, inclined, gas disk models. We see evidence (in modeling and narrowband imaging) for a nuclear gas disk extending out to about 0.4" (14 pc) which is greatly inclined relative to the galaxy's spiral disk. It may be unrelated to the maser disk (r$\sim$0.3 pc), given that it's major axis and inclination each differ from the maser disk by about 25 degrees. Our best models show a BH mass of 3-8$\times10^7 M_\odot$, consistent with maser results.

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Date submitted: 18 Mar 2016 Electronic form version 1.4