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Gas and Stellar Kinematics in the Galaxy NGC 4736 ANDREW MAGYAR, JASON PINKNEY, Ohio Northern University, KARL GEBHARDT, University of Texas at Austin — We use long-slit spectroscopy and CCD imaging from both ground-based and space-based observatories to analyse the gas and stellar kinematics of the Sa/b galaxy NGC 4736 (M 94). We intend to measure the mass of the central supermassive black hole. We use standard software (IRAF) for the reduction of the spectra, and to create a continuum-subtracted H-alpha image. We develop our own software for the fitting of absorption and emission lines. It subtracts the absorption-line (stellar) component from the emission-line spectra using a shifted template star. This improves the measurements of the shape, centroid, and line strengths of the residual emission lines (H-alpha, [NII], [SII]). We present a preliminary comparison of stellar and gas kinematics, including rotation curves and spatially resolved velocity dispersion. The emission line velocity profile is complex at both low and high resolutions. At high resolution, the profile is not consistent with a simple disc model for the line emitting gas, confounding the measurement of a central black hole.

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