Gaussian Representation of Active Galactic Nuclei

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Active galactic nuclei (AGN) are the areas around the centers of galaxies with high luminosity in much of the electromagnetic spectrum. The existing model of AGN describes the high luminosity as the result of accretion of matter around a black hole at the galaxy's center. Many AGN generate superluminal jets of density higher than the surrounding interstellar medium. The cause for and mechanics driving the relativistic jets are not well understood. In addition, the jets often change direction decaparsecs away from their associated cores, the cause of which has not been well explained. In order to better understand the mechanics of relativistic jets new modeling techniques are used to reveal trends in the behavior of jet features. We develop a computer program that produces an image of elliptical, normally-distributed representations of prominent features in the jets and the core, then interpolates for time between images of the same object, and finally produces a movie of the interpolated images. The script utilizes data gathered as part of the Monitoring Of Jets in AGN with VLBI Experiments (MOJAVE) program. Currently the Gaussian interpolation script has been written and implemented successfully on a test data sample. The next step is to run the script recursively on many objects in the MOJAVE database. Subsequent qualitative analysis of the movies it produces will reveal if any previously unobserved behaviors are present or any new conclusions can be drawn about relativistic jets. This work can be used to develop better models of AGN and extragalactic objects.