CONTOUR SIMULATIONS OF ASTROPHYSICAL JETS

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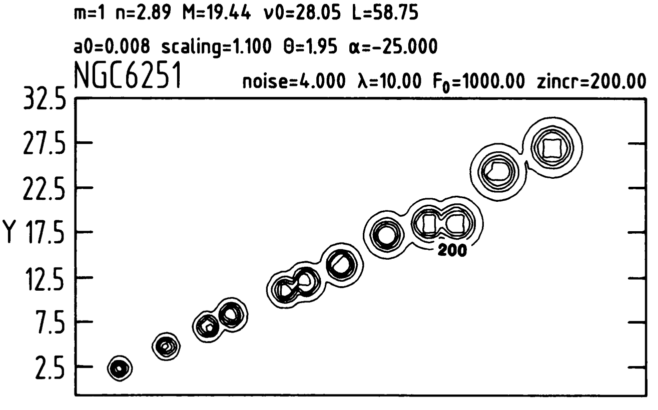
ABSTRACT. We apply the theory of the Kelvin-Helmholtz instabilities to trace the jet's pattern. A certain level of noise is introduced.

Adopted parameters: m is the azimuthal number chosen, n the number of the e-folding lengths after which the jet becomes unstable, M the Mach number, ν_0 the density contrast, L the jet's length, a_0 the initial amplitude, "scaling" represents the ratio between the length of the x-axis of the observed map and the jet's length, θ is the opening angle, and α the angle of rotation from the horizontal position. In order to make more realistic simulations we introduce some *noise*; the blobs will be placed at a position given by a pseudo-random real number taken from a normal (Gaussian) distribution with mean $\bar{x}$ where $\bar{x}$ is the predicted distance, and standard deviation σ where $\sigma = \lambda$/noise.

The relativistic particles are assumed to diffuse away from the accelerating regions (blobs) of increasing radius r_0, through a steady random walk of mean free path λ. We then take a grid of 100 by 100 points on the plane of the trajectory selecting in each one the maximum intensity from the various blobs. We report in Fig. 1 the isoemissivity contours in arbitrary units of the initial flux F_0. "zincr" is the distance between the various levels.



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