

## GAS AND STAR KINEMATICS IN ELLIPTICAL GALAXIES

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Since the time it became evident that ellipticals are not rotationally supported, there has been an increasing interest on their dynamical properties, and new models have been formulated. However, the spectroscopic, as well as the photometric and morphological observations, do not provide yet a clear understanding of the structure of these objects, just proving that they are much more complicated than thought before. An obvious way to attack the problem seems to look at the motions of the gaseous component in those few cases where it is present, because of the different response to the same potential field of the gas and star components.

In this paper an account is given of the spectroscopic observations of the gaseous and stellar components in four E galaxies, namely NGC 1052, NGC 2749, NGC 3998 and NGC 4125, to be published in full elsewhere. We present velocity dispersion profiles and radial velocity curves from both absorption and emission ( $\lambda$  3727-29) lines, based on photographic spectra taken with the 4m Kitt Peak and 5m Palomar telescopes. The reduction procedure is based on the Fourier Quotient Method. The radial velocity curves for NGC 4125 (the only galaxy observed also along the minor axis) and NGC 3998 were also derived by measurements with a Grant machine. The velocity dispersion profiles of the inner regions (typically 0.1 from the nucleus) from the absorption lines are constant or peaked at the center. The same profiles for the gas obtained from the [OII]  $\lambda$  3727-29 accounting for the blend, have similar trends but are scaled down by a factor about 0.5 in the mean.

The ratio between the slopes of the emission and absorption velocity curves along the major axis is about 1 for NGC 1052, larger than 3 for NGC 4125 and 0.7 for NGC 3998. In the latter case, the low value is accounted by the fact that our measurements, together with those of Blackman et

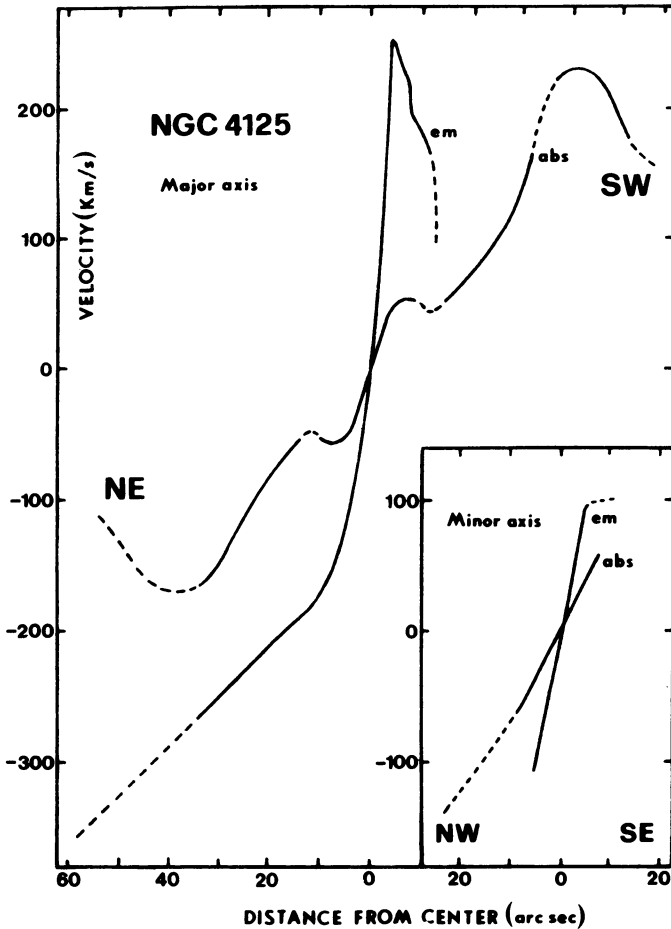


FIGURE 1. Smooth representation of the radial velocity curves (scaled to the systemic velocity) of the E4 galaxy NGC 4125 along the major and minor axes from absorption and emission lines.

al. (1972) indicate that the maximum slope of the gas velocity curve is found along a direction which lies at about  $45^\circ$  from the isophotal major axis.

A quite exceptional behaviour is found in NGC 4125. This fairly flat galaxy (E4) exhibits significant amount of rotation. The absorption velocity curve is fairly symmetric, while that derived for the gas is strongly asymmetric and extends much more on the NE side. In addition a strong velocity gradient is measured along the minor axis both for the gaseous and stellar components (Fig. 1). Among the various possibilities which can be considered to explain this object we mention that of a merging process.

#### REFERENCE

Blackman, C.P., Wilson, H.S., Ward, M.J.: 1982, M.N.R.A.S. in press.