

Arms pattern speed of galaxies in clusters

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Abstract. Disks of galaxies in clusters are deeply affected by interactions. We investigate the pattern speed of galaxies in cluster in order to detect a possible dependence with cluster environmental parameters, such as galaxies density. If the perturbation of cluster galaxies is mainly produced by the interaction with the cluster ambient, the pattern speed might well depend on the history of the galaxy orbit within the cluster. Tremaine & Weinberg (1984) method is applied to 2-D H_α velocity fields, reconstructed from the isovelocity contours published by Amram *et al.* (1992), and 2-MASS K-band images (Skrutskie 2001) to obtain spirals pattern angular speed. The use of K-band images and H_α velocity maps is justified by the fact that the perturbations imprinted in H_α velocity maps are produced by the old stellar population which emits most of its energy in the near-IR. We analyzed Pegasus I cluster galaxies NGC 7593, NGC 7631 and NGC 7643 (this one shown in Figure 1). Preliminary results indicates that NGC 7593 presents a pattern speed $\Omega_p \sin(i) = 18 \pm 5 \text{ km s}^{-1} \text{ kpc}^{-1}$, (inclination $i = 51^\circ$) while NGC 7631 and NGC 7643 pattern speeds are $\Omega_p \sin(i) = 21 \pm 4 \text{ km s}^{-1} \text{ kpc}^{-1}$ and $\Omega_p \sin(i) = 35 \pm 3 \text{ km s}^{-1} \text{ kpc}^{-1}$ (inclinations $i = 64^\circ$ and 59° respectively). In the three successful cases the correlation coefficients in the $\langle X \rangle$ vs $\langle V \rangle$ plots are 0.94, 0.95 and 0.98 respectively. We are presently analyzing other galaxies in the cluster.

Keywords. galaxies: spiral, galaxies: clusters

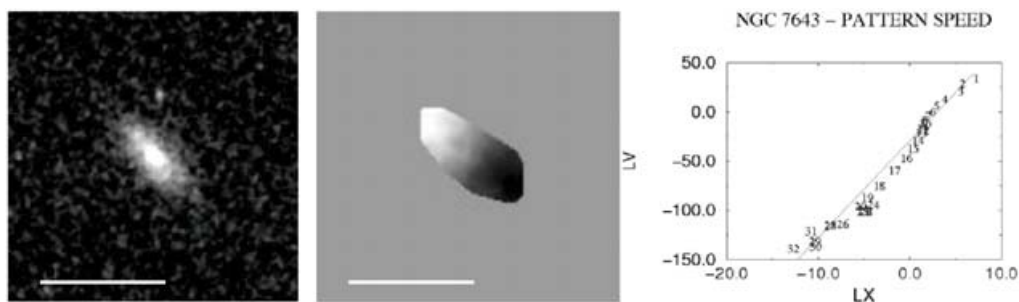


Figure 1. Left panel: 2MASS K-band image of NGC 7643. The white line is 1 arcminute long, corresponding to 16.6 kpc. Center panel: velocity map of NGC 7643. Right panel: plot $\langle X \rangle$ vs $\langle V \rangle$, from which Ω_p can be obtained.

References

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