

## **Corrugated velocity pattern in spiral galaxies: NGC 278, NGC 1058, NGC 2500 and UGC 3574**

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### **Abstract**

We report the detection in H $\alpha$  emission of a radial corrugation pattern in the vertical velocity field of a sample of nearby face-on, spiral galaxies. We obtain long-slit spectra with the double arm ISIS spectrograph, attached to the 4.2 m William Herschel Telescope. The existence of corrugations has been already reported, e.g. Alfaro et al. (2001), Matthews & Uson (2008). Corrugations are closely link, as cause/effect, to the large scale star formation processes: density waves, tidal interactions, galactic bores, collisions of high velocity clouds with disk, etc. Which mechanism is the origin of disk corrugations is still an open problem. In this work not only the existence of radial and azimuthal corrugations are clearly observed, we report a first systematic study on the velocity corrugations in a sample of nearby face-on spiral galaxies. NGC 278 and NGC 1058 show a similar behavior to NGC 5427 (Alfaro et al. 2001), with a clear displacement between the velocities and emission line peaks. Where the approaching velocity peaks occur in the convex border of the arms, and the receding maxima are located behind the H $\alpha$  emission maxima, in the concave side. This kinematical behavior is similar to the one expected in a galactic bore generated by the interaction of a spiral density wave with a thick gaseous disk. NGC 2500 and UGC 3574 do not show so clear this last relation between the velocity and emission line peaks, a possible cause should a fainter and discontinuous H $\alpha$  emission. Oddly, these two pairs of galaxies also differ between them in their ionization mechanism features obtained from diagnostic diagrams.