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2D-Chemical Evolution Models: The spiral wave over-density role.

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Abstract

Chemical evolution models are a powerful tool to interpret and explain the possible scenarios of galaxies formation and evolution. They infer how the chemical elements, formed inside the stars, are redistributed into the interstellar medium. Until recently, due to the lack of 2D information, these models assumed azimuthally symmetric abundances distributions, and the important issue of the possible dispersion of abundance values at a given galactocentric distance was not addressed. A spiral disk, however, requires a full 2D description so that arms, bars and other structures, as those produced by mergers or interactions, may be also included. Our objective is to develop the most comprehensive and sophisticated 2D chemical evolution models for spiral and irregular galaxies, constrained by observed abundance distributions using the state of the art IFS data of nearby galaxies, which have improved extraordinarily the spatial resolution. In the present preliminary work we start by including the spiral wave as a first step. The spiral wave produce an over-density in comparison with the average mass density on the disk (with its radial exponential decrease).We have modified our classical chemical evolution model in 1D and performed a first 2D-model applied to a Milky Way like galaxy. We analyze the resulting elemental abundances and star formation rate (SFR) 2D-distributions. (See poster).