

PROPAGATING STAR FORMATION

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We develop the idea that star formation is a propagating process in galaxies. The basic mechanism of propagation is the accumulation of mass in expanding cold shock-waves. The expansion energy can be inserted by massive stars of an OB-association or it may originate from collisions of high velocity clouds with the galactic disk.

The original supersonic expansion is decelerated by the accumulation of the ambient medium. 3D simulations show that bubbles are unable to blow out to the halo if a thick HI disk is present. In the plane, the expansion leads in some cases to column densities higher than the threshold value for molecule formation. If the lifetime of molecular clouds is limited, and if no external trigger is needed to begin star formation after cloud formation, then this is the mechanism in which star formation propagates: star formation which has occurred within a molecular cloud in one place can via expanding supershells initiate formation of a new molecular cloud at a different place. A more detailed description of the model will be published elsewhere (Palous and Tenorio-Tagle, 1990).

In our computer experiments, we started with a few star forming regions. These induced the formation of new ones and soon 'infecte' the entire disk with star formation. In the outer parts of the disk we could detect long-lasting spiral-like features.

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REFERENCES

Palous, J. and G. Tenorio-Tagle, 1990 in preparation