Triggered Star Formation in a Turbulent ISM
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Formation and destruction of clouds and spurs in spiral galaxies

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Abstract. We investigate the formation of clouds and substructure in spiral galaxies using high resolution global MHD simulations, including gas self gravity. Previously, local modeling by Kim & Ostriker (2002) has shown that self gravity and magnetic fields cause the growth of high density clumps in the spiral arms rather rapidly; subsequently, these clumps result in the formation of sheared, feather like structures in the interarms, known as spurs. Recently, we performed global simulations and found that gas self-gravity can cause the growth of sheared features regardless of the strength of the external spiral potential. However, a sufficiently strong spiral potential is required to produce arm clouds as well as spurs, which are the filamentary structures distinctly associated with the spiral arms, having near-perpendicular intersections with the main dust lane. We are currently performing higher resolution simulations to study the detailed properties of the clouds and spurs; we are also including a feedback mechanism, representing turbulent forcing via supernovae, to destroy the clouds. We will thus assess the role of turbulence on the clump formation rate and properties. Further, we will also follow how subsequent arm and spur morphology develops under quasi-steady conditions.