Triggered Star Formation in a Turbulent ISM
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Triggered star formation within the bright-rimmed cloud SFO 75

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Abstract. We present the results of a multi-wavelength line and continuum study of the bright-rimmed cloud SFO 75 in an attempt to determine whether the ionisation front and its associated shocks, driven by the nearby O star, have triggered the formation of a new generation of stars within this bright-rimmed cloud.

Keywords. Radio continuum: stars – Stars: formation – Stars: pre-main sequence.

1. Summary and Conclusions

We present the results of CO, 1.3 cm radio continuum, mm-continuum and ammonia observations of the bright-rimmed cloud SFO 75 (Sugitani & Ogura, 1994; Thompson *et al.* 2004; Urquhart *et al.* 2006). These observations reveal the presence of an over-pressured layer of ionised gas at the surface of the cloud which is likely to be driving shocks into the cloud. This is supported by evidence of shocked gas in the surface layer of the cloud as seen in the ^{13}CO position-velocity diagram. The CO and mm-continuum data show the presence of a dense core, located slightly behind the cloud's rim, with a mass of $\sim$200–400 $M_\odot$ and a density of 3–8$\times10^4$ cm^{-3}. From a two component fit to the IRAS and mm-continuum fluxes we obtain an total bolometric luminosity of $\sim$2.6$\times10^4$ $L_\odot$, which would support the presence of an embedded B0 ZAMS star. The ammonia observations have resolved the mm-core into two separate cores; Core A is located directly behind the rim the morphology of which correlates extremely well with that of the rim; and Core B which is located farther back from the rim. Core A is coincident with a GLIMPSE point source, and therefore, star formation is likely to be taking place. From the data we have presented it is clear that the ionisation by the nearby OB star is having a dramatic effect on the evolution of this cloud. What is not yet clear is whether this has triggered a new generation of star formation within this cloud.

References

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