J/A+A/594/A58 Hi-GAL l=224deg region CO(1-0) data cubes (Olmi+, 2016)

The segregation of starless and protostellar clumps in the Hi-GAL l=224deg region
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=2016A&A...594A..58O (SIMBAD/NED BibCode)

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Keywords: stars: formation - ISM: clouds - ISM: molecules

Abstract:
Stars form in dense, dusty structures, which are embedded in larger clumps of molecular clouds often showing a clear filamentary structure on large scales (>1pc). The origin (e.g., turbulence or gravitational instabilities) and evolution of these filaments, as well as their relation to clump and core formation, are not yet fully understood. A large sample of both starless and protostellar clumps can now be found in the Herschel Hi-GAL (Herschel Infrared GALactic Plane Survey) key project, which also provides striking images of the filamentary structure of the parent molecular clouds. Recent results indicate that populations of clumps on and off filaments may differ. One of the best studied regions in the Hi-GAL survey can be observed toward the l=224° field. Here, a filamentary region has been studied and it has been found that protostellar clumps are mostly located along the main filament, whereas starless clumps are detected off this filament and are instead found on secondary, less prominent filaments. We want to investigate this segregation effect and how it may affect the clumps properties. We mapped the ^{12}CO(1-0) line and its main three isotopologues toward the two most prominent filaments observed toward the l=224° field using the Mopra radio telescope, in order to set observational constraints on the dynamics of these structures and the associated starless and protostellar clumps. Compared to the starless clumps, the protostellar clumps are more luminous, more turbulent and lie in regions where the filamentary ambient gas shows larger linewidths. We see evidence of gas flowing along the main filament, but we do not find any signs of accretion flow from the filament onto the Hi-GAL clumps. We analyze the radial column density profile of the filaments and their gravitational stability. The more massive and highly fragmented main filament appears to be thermally supercritical and gravitationally bound, assuming that all of the non-thermal motion is contributing thermal-like support, suggesting a later stage of evolution compared to the secondary filament. The status and evolutionary phase of the Hi-GAL clumps would then appear to correlate with that of the host filament.

Description:
The files are the Mopra telescope data cubes used to produce the channel maps shown in Appendix A. Intensity units are Ta*[K]. Data cubes are not (baseline) reduced. Noise in the maps is not uniform. Frequency resolution is 33.7kHz.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
list.dat	109	4	*List of data cubes
fits/*	0	4	Individual data cubes (intensity units are Ta*[K])

Note on list.dat: resolution is 12arcsec (spatial) and 33.7kHz (frequency).

Byte-by-byte Description of file: list.dat

Bytes	Format	Units	Label	Explanations
1- 9	F9.5	deg	RAdeg	Right Ascension of center (J2000)
10- 18	F9.5	deg	DEdeg	Declination of center (J2000)
20- 22	I3	---	Nx	Number of pixels along X-axis
24- 25	I2	---	Ny	Number of pixels along Y-axis

27- 29	I3	---	Nz	Number of pixels along Z-axis
31- 39	F9.2	m/s	bVlsr	Lower value of VELO-LSR interval
41- 47	F7.1	m/s	BVlsr	Upper value of VELO-LSR interval
49- 55	F7.4	m/s	dVlsr	VELO-LSR resolution
57- 66	F10.6	GHz	RestFreq	Rest frequency
68- 72	I5	Kibyte	size	Size of FITS file
74- 86	A13	---	FileName	Name of FITS file, in subdirectory fits
88-109	A22	---	Title	Title of the FITS file

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(End) Patricia Vannier [CDS] 03-Aug-2016

*The document above follows the rules of the Standard Description for Astronomical Catalogues; from this documentation it is possible to generate **f77** program to load files into arrays or line by line*