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Authors	Juarez, C., Girart, J. M., Frau, P., Palau, A., Estalella, R., Morata, O., Alves, F. O., Beltrán Sorolla, Maria Teresa, Padovani, Marco
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J/A+A/597/A74FeSt 1-457 IRAM and PdBI maps(Juarez+, 2017)

A correlation between chemistry, polarization and dust properties in the Pipe nebula starless core FeSt 1-457.

Juarez C., Girart J.M., Frau P., Palau A., Estalella R., Morata O., Alves F.O., Beltran M.T., Padovani, M.
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[=2017A&A...597A..74J](#) (SIMBAD/NED BibCode)

ADC_Keywords: Molecular clouds ; Radio lines

Keywords: stars: formation - ISM: individual objects: FeSt 1-457 nebula - ISM: molecules - radiative transfer

Abstract:

Pre-stellar cores within molecular clouds provide the very initial conditions in which stars are formed. FeSt 1-457 is a prototypical starless core and the most chemically evolved among those isolated, embedded in the most pristine part of the Pipe nebula, the bowl.

We use the IRAM 30m telescope and the PdBI to study the chemical and physical properties of the starless core FeSt 1-457 (Core 109) in the Pipe nebula.

We fit the hyperfine structure of the N₂H⁺ (1-0) IRAM 30m data. This allowed us to measure with high precision the velocity field, line widths and opacity and derive the excitation temperature and column density in the core. We used a modified Bonnor-Ebert sphere model adding a temperature gradient towards the center to fit the 1.2mm continuum emission and visual extinction maps. Using this model, we have estimated the abundances of the N₂H⁺ and the rest of molecular lines detected in the 30GHz wide line survey performed at 3mm with IRAM 30m using ARTIST software.

Description:

IRAM 30m (FTS correlator) and PdBI 3mm observations towards the starless core FeSt 1-457 in the Pipe nebula. Dense core tracer N₂H⁺ (1-0) was observed with a better spectral resolution with the IRAM 30m VESPA correlator (0.06km/s).

Objects:

RA	(2000)	DE	Designation(s)
17 35 45	-25 33.2		FeSt 1-457 = DCl d 001.6+03.8

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
list.dat	117	19	List of fits files
fits/*	0	19	Indifidual fits files

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- 26	I3	---	Ny	Number of pixels along Y-axis
28- 30	I3	---	Nz	? Number of slices for the datacube
32- 34	I3	Kibyte	size	Size of FITS file
36- 48	A13	---	FileName	Name of FITS file, in subdirectory fits
50-117	A68	---	Title	Title of the FITS file

Acknowledgements:

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(End) Carmen Juarez [CSIC-IEEC, Spain], Patricia Vannier [CDS] 31-Oct-2016

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