Revista Mexicana de Astronomía y Astrofísica, **00**, 1–8 (2019)

https://doi.org/10.22201/ia.01851101p.2099.00.00.00

A DEMONSTRATION DOCUMENT FOR THE REVMEXAA MAIN JOURNAL

W. J. Henney [1], A. Collaborator,[2] and L. Author[2,3,4]

Received ; accepted

ABSTRACT

This document (`rm-journal-example.tex`—last updated 2019 November 12) gives a brief tutorial in the use of version 3 of the `rmaa` LaTeX macros and can also serve as a template for the preparation of papers to be published in the main journal. More details can be found in the user guide (`authorguide.pdf`). It is assumed that you are already familiar with the rudiments of LaTeX. In case you are not, some suitable references are given in `authorguide.pdf`.

RESUMEN

Este documento (`rm-journal-example.tex`—última actualización 12 de noviembre del 2019) proporciona un tutorial breve en el uso de la versión 3 de los macros de LaTeX `rmaa` y además puede servir cómo modelo para la preparación de los artículos que se publicarán en la revista principal. Se puede encontrar más detalles en la guía del usuario (`authorguide.pdf`). Se supone que usted es ya familiar con los rudimentos del LaTeX. En el caso contrario, se dan algunas referencias convenientes en el `authorguide.pdf`.

Key Words: H II regions — ISM: Jets and outflows — Stars: Pre-main sequence — Stars: Mass loss

1. GENERAL

Articles to be considered for publication in the main journal should be prepared in the "manuscript" style, which is now the default when no explicit options are given to the `\documentclass` command. The reason for this is to allow authors to concentrate on the content of their paper, rather than the details of the typesetting. This style also has ample margins to allow a comfortable number of words per line and to leave room for marginal notes.

Please use standard LaTeX sectioning commands to subdivide your document. You should use mixed case for the section titles, although in the current style this only really matters at the level of `\subsection` and below.

It is preferable to use the `\label`/`\ref` mechanism for cross-references in order to (1) minimise the chance of errors, and (2) allow automatic hyperlinks in PDF output (finally implemented in version 3.27). Note that this sometimes requires LaTeX to be run twice inorder to resolve all of the references.

The style that should be used for cross-references is, for example, Figure 4, Table 1, equation (1), and § 3, where the section symbol "§" is produced by the LaTeX command "`\S`".

General typographic best practices are discussed in § 2, while following sections discuss how to format include figure (§ 3), tables (§ 4) and citations (§ 5).

2. BEST PRACTICES FOR TYPESETTING YOUR PAPER

Usually, the right way of doing things is no more difficult than the wrong way, once you have learned it.

2.1. *Special Commands Inherited from AAS Macros*

The `rmaa` macros implement all the "astronomical" commands defined in the AASTeX macros. Please try to use these since it helps ensure consistency of appearance and usage between papers. In many cases I have tried to improve on the AASTeX implementations. Commonly used examples are

1. The `\ion` command: H II, Fe XXVI, etc. This can be happily used inside or outside math mode

[1]Instituto de Radioastronomía y Astrofísica, UNAM, Morelia, México.

[2]Instituto de Astronomía, UNAM, CDMX, México.

[3]Please note that affiliations end in periods. In the main journal, full postal addresses are given at the end of the paper, with only abbreviated versions appearing here.

and inside figure captions. The ion stage can be specified as an arabic or roman numeral: `\ion{H}{2}`, `\ion{H}{ii}`, and `\ion{H}{II}` will all produce the same output. One caveat: `\ion` cannot be used inside the `\addkeyword` command—just use `H~II` there if necessary.

2. The `\arcsec`, `\arcmin` and `\arcdeg` commands, together with their "fractional" relatives, `\farcs`, etc. These are used in the following way:

```
at declination
15\arcdeg\,33\arcmin\,22\farcs{}2
```

... at declination 15° 33′ 22.″2 *...*

Again, they can be used inside or outside math mode.

2.2. *Math Symbols and Equations*

Symbols for physical quantities should usually be italic: velocity, v, density, N, etc. However, multi-letter symbols generally look better in roman: FWHM, EM, etc. Subscripts should be in roman (coded using `\mathrm`) unless they are themselves variables: $N_{\rm e}$, $T_{\rm eff}$, but $\sum_i a_i$. Physical units should in roman, with thin spaces: $10\,{\rm K}$, $1.2 \times 10^{-12}\,{\rm erg\,cm^{-2}\,s^{-1}}$, etc. Things generally come out best if you place an entire expression within a single pair of $'s and then make judicious use of `\mathrm`. For example

$$\mathrm{FWHM} = \int N_{\rm e} N_{\rm i}\, dz$$

Remember that the "minus sign" only exists inside math mode: minus two is -2, not -2, nor even –2! Also, remember that spacing inside math mode is designed for equations, not words, so you shouldn't use $'s just to get italic text. Compare $effective$ and *effective*.

The `\frac` command (and its TEX relative `\over`) are best only used in displayed equations. Something like

$$x = \frac{a+b}{c} \tag{1}$$

looks fine, whereas $x = \frac{a+b}{c}$ is somewhat cramped. Better rewritten as $x = (a+b)/c$.

How to define a macro that can be used inside or outside math mode. Use the `\ensuremath` command. For instance:

```
\newcommand{\fluxunits}{%
   \ensuremath{\mathrm{%
      erg\,s^{-1}\,cm^{-2}}}}
```

Then you can write either `15.1\,\fluxunits` or `$2.3\times 10^{-11} \, \fluxunits$`

2.3. *Spacing After Periods*

TEX/LATEX distinguishes between inter-word spaces and inter-sentence spaces. The latter are slightly wider and considerably more "stretchy" than the former. A period that follows a lower-case letter is assumed to end a sentence, while one that follows an upper-case letter is not. This heuristic produces correct results 99% of the time, but there are two cases where you need to give a helping hand by using the `\@` command, which causes LATEX to "forget" what was just before it.

Lower case abbreviations ending in periods. The only common example is "et al.", which should always be coded as, for example,

```
Henney et~al.\@ (2002).
```

Other examples, such as "e.g." and "i.e." should normally be followed by a comma, so do not present this problem. The only other example I have encountered is "cf." but this should be followed by a tie since we don't want a linebreak between it and the following word:

```
(cf.~Jones 1990)
```

Sentences that end in a capital letter. These are more common than you might think and should be coded as in the following examples.

```
provided by NASA\@. Next sentence
```
... provided by NASA. Next sentence ...

```
a width of 1.5\,\AA\@. Next sentence
```
... a width of 1.5 Å. Next sentence ...

Note that "Å" is considered by LATEX to be a capital letter, as in the second example.

2.4. *Spacing in/after macros*

It is never a good idea to include explicit space at the end of a definition of a user macro. Examples such as the following should be avoided:

```
\newcommand{\kms}{km\,s$^{-1}$\ }
```
Wrong!

This will make the spacing come out right when you write

```
a speed of 5000~\kms is quite fast
```
a speed of 5000 km s^{-1} is quite fast

but it won't work if the macro is followed by a punctuation mark, such as

```
with values 5~\kms, 10~\kms, and
```
with values 5 km s^{-1} , 10 km s^{-1} , and ...

The right way[4] to go about this is to define the macro without any following space:

```
\newcommand{\kms}{km\,s$^{-1}$}    Right!
```

Then, whenever you use the macro *always* follow it with an empty pair of braces, i.e., `\kms{}`. That way the spacing will come out right in all circumstances.

2.5. *Avoid Excessive Fiddling With the Layout*

The `rmaa` macros include various commands for final tweaking of a paper, such as `\adjustfinalcols`, `\RescaleTitleLengths`, etc. There is little value in using these for a submitted manuscript. However, authors may want to us them to fine-tune the appearance of a preprint.

2.6. *Other Minor Points*

By tradition, satellites should be in italic: *HST*, *ISO*, etc. Don't ask me why.

Compound adjectives are generally hyphenated, whereas the corresponding noun is not. E.g., "mass-loading rate" but "in the absence of mass loading". However, you shouldn't hyphenate a number (written as digits) and a unit. E.g., "using a 4 m telescope", "we observed 15 GHz emission".

A range of numbers is indicated by an "en-dash" (–), coded as `--`, as in "in the range 4000–6000 Å". An "em dash" (—), coded as `---` is used for punctuation. For example:

> *We also stress that our observations—at a single wavelength—cannot confirm the thermal nature of the emission.*

There should be no space around the "—".

Numbers larger than 9999 should have a comma. E.g., 10,000 K but 9000 K.

3. INCLUDING FIGURES

Figure 1 shows the simplest possible example of how to include an EPS graphic file in a single-column figure. In order to produce the highest-quality results and the smallest-possible EPS file sizes, it is important to make sure you are using a vector format for the text and line-art parts of the graphic. Failure to do so tends to result in disasters like that shown in Figure 2. Either that, or, in an effort to produce acceptable quality lines and text from a raster-format EPS file, you end up with the file being many megabytes in size. A common cause of problems is the use programs such as xv of ImageMagick. Once a postscript file has been read in by one of these

[4] Of course, an even better way would be to use `\ensuremath`, as described above in § 2.2

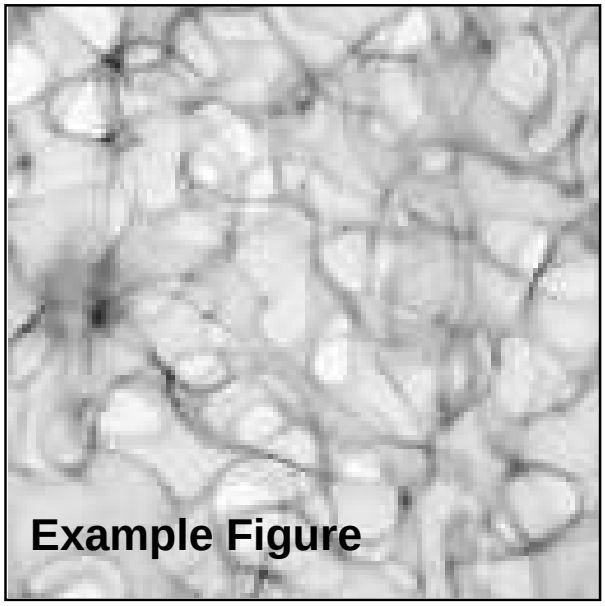

Fig. 1. Example of a simple single-column figure.

Bad Bitmap Figure!

Fig. 2. How not to do a figure. This may not look so bad on the screen but try printing it out and you'll see what I mean.

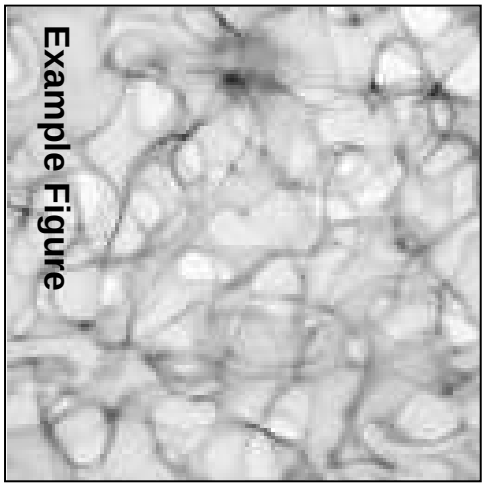

Fig. 3. Example of a rotated figure using the `angle` keyword to `\includegraphics`. Note that in the general case of a non-square figure, `angle=` should come before `width=` to avoid confusion. In this example the figure has also been reduced to 80% of the column width and is centered by means of the `\centering` command. You should not use the `center` environment for this since it introduces unwanted vertical space.

Fig. 4. Example of a cropped figure using the `bb` and `clip` keywords. The syntax is "`bb =` x_0 y_0 x_1 y_1" where (x_0, y_0) and (x_1, y_1) are the coordinates (in points) of the bottom-left and upper-right corner, respectively. Note that the EPS file used for this figure is the same as in the other examples.

programs and then saved again (even if saved as postscript), it has been irreversibly converted into a raster format, usually with drastic concomitant loss of quality.

Sometimes your figure will come out sideways when you try to include it. In this case you should use the `angle` keyword to `\includegraphics`, as shown in Figure 3.

On other occasions, you only want to include a certain portion of the EPS graphic. This can be achieved by means of the `bbox` keyword, which allows you to manually specify the graphic's bounding box, as illustrated in Figure 4. You will also want to use the `clip` keyword to prevent the unwanted parts of the figure from being displayed. This technique is also useful in cases where the bounding box specified in the EPS file is not "tight" around the graphic. The easiest way to find the bounding box you want is to load the EPS file in gv or a similar program. Then, when you move the mouse cursor over the figure, the coordinates (in points) of the current cursor position should be shown in a little window at the top-left. Thus, it is straightforward to find the coordinates of the bottom-left and top-right corners of the desired rectangular region.

Figure 5 shows a double-column figure containing two EPS graphics and Figure 6 is a more complicated example of the same.

Color Graphics Color plates greatly increases the printing costs and so are best avoided. On the other hand, including color figures in the online version costs nothing. The best solution is for the author to provide alternative grayscale versions of any color images, which can then be used in the printed version. Otherwise, the way your beautiful color picture gets converted to black-and-white will be entirely at the mercy of the editors and printers. Remember, too, that grayscale images generally look better on a negative scale.

4. HOW TO DO TABLES

An example of a simple table is given in Table 1. Some points to note are:

TABLE 1

A SIMPLE TABLE ($x = 1.0$)[a]

Ion	NGC 5461	NGC 5471
O^0	7.08 ± 0.20	6.63 ± 0.20
O^+	8.08 ± 0.14	7.32 ± 0.14
O^{++}	8.32 ± 0.07	8.02 ± 0.07
N^+	7.04 ± 0.12	6.01 ± 0.13
Ne^{++}	7.59 ± 0.11	7.32 ± 0.10
S^+	6.02 ± 0.19	5.47 ± 0.20
S^{++}	7.00 ± 0.10	6.45 ± 0.10
Cl^{++}	4.93 ± 0.16	4.20 ± 0.16
Ar^{++}	6.15 ± 0.12	5.55 ± 0.14
Ar^{3+}	...	5.07 ± 0.10

[a]Note the use of `\lowercase` to prevent the x from being converted to upper case.

1. We use the `booktabs` package (loaded automatically), which gives improved vertical layout with respect to the standard LaTeX version. As a user, the only impact of this is that you must use `\toprule`, `\midrule`, and `\bottomrule` instead of `\hline` to give the horizontal rules. Vertical rules should never be used.

2. Footnotes to the table can be entered using a `\tabnotemark`, `\tabnotetext` pair. Note that `\tabnotetext` occurs inside the `tabular` environment and that for it to work properly you must use the `\tablecols` command to specify the number of columns in the table and set the length `\tabnotewidth` to a sensible value.

3. The intercolumn spacing can be adjusted by setting the length `\tabcolsep`. Things usually look best when this is set so that the table fills the entire width of a text column as closely as possible.

4. Missing data is indicated by the `\nodata` command, as in AASTeX.

Table 2 is a somewhat more complicated example. Some features of this example are:

1. The use of `\cmidrule` for partial horizontal rules.

2. Somewhat elaborate adjustments to the horizontal spacing so as to visually tie together subgroups of the columns. Two different mechanisms are used to achieve this. That of putting

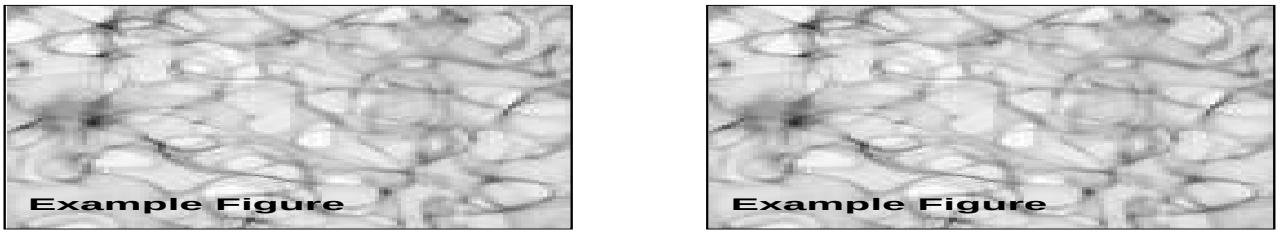

Fig. 5. Simple example of a wide figure that spans both columns and includes two EPS files. The individual EPS graphic widths and spacing between them are set to be the same as that of the columns of text (`\columnwidth` and `\columnsep`) respectively. Note the use of `%` to suppress unwanted spaces. Alternatively, you may want a single EPS graphic to span the entire width, in which case you would put `width=\textwidth` instead. In this example, both the `width` and `height` keywords are used, forcing the scaling to be anisotropic. You will never normally want to do this.

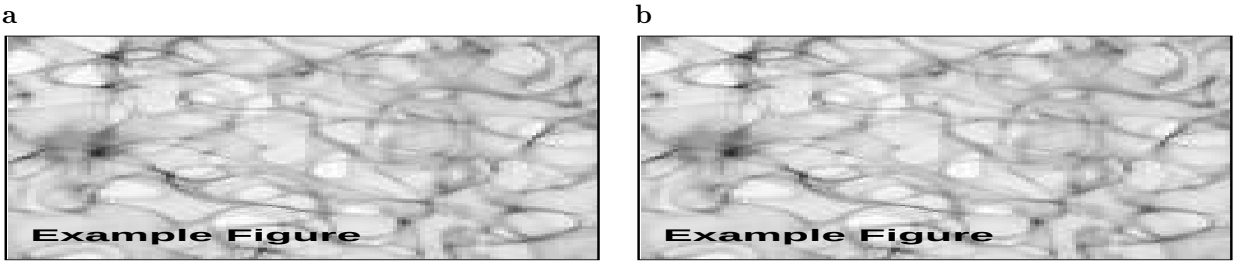

Fig. 6. A more complicated example of a multipart figure, using LaTeX itself to put the **a** and **b** labels on. (*a*) Multipart figures are captioned like this. (*b*) The second part of the figure. Note that the `tabular` environment is an easy way to arrange the subfigures and their labels.

in an empty "ghost" column is probably the easiest to manage. The other is to use the `@` specifier with a user-defined horizontal space.

3. The table is wider than will fit in the normal text width. To remedy this, we wrap the table inside the `landscape` environment, which rotates the entire page by 90 degrees. A disadvantage of this approach is that the article text cannot flow around the table, which is forced to appear on its own page. This requires that either the `lscape` or `pdflscape` package must be loaded in the preamble.

If your table will not fit on one page (even when rotated), then you can use the `longtable` package. I can provide an example of this on request.

TABLE 2

A MORE INVOLVED TABLE THAT IS ROTATED TO FIT BETTER ON THE PAGE[a]

	Ionization Stage							
	Log (Radial Average)				Log (Volume Average)			
Element	I	II	III	IV	I	II	III	IV
Hydrogen	−2.738	−0.001	···	···	−1.610	−0.011	···	···
Helium	−1.661	−0.009	···	···	−0.567	−0.137	···	···
Nitrogen	−3.045	−0.836	−0.069	−3.605	−1.785	−0.270	−0.351	−4.288
Oxygen	−2.822	−0.452	−0.191	···	−1.584	−0.150	−0.574	···
Neon	−2.842	−0.169	−0.494	···	−1.815	−0.058	−0.960	···
Sulfur	−5.322	−1.276	−0.042	−1.420	−4.247	−0.597	−0.132	−2.069
Chlorine	−4.716	−1.093	−0.041	−2.037	−3.644	−0.477	−0.177	−2.689
Argon	−3.585	−1.382	−0.023	−1.996	−2.283	−0.490	−0.175	−2.657

[a]The original of this and the previous table come from Luridiana et al. (2002) RevMexAA 38, 97.

5. HOW TO DO REFERENCES

The style of the reference list follows that of the ApJ, AJ, etc. That is:

- Comma after each surname, space between initials (unlike A&A).
- No comma before year.
- Commas everywhere else.
- If there are more then 6 authors you should use et al.

An almost bulletproof way of getting your reference list right is to grab them from ADS (select "AASTEX reference style"). The `rmaa` macros recognize all the AAS journal abbreviation commands.

In the text, references should be cited as follows:

... it has been found (García 1990; López 2000a,b) that ... following Bloggs (1990) ... is not true (despite what Rodríguez 1759 maintains) ...

Note the use of semicolons between consecutive references and the lack of comma between author and date. In order to save effort and reduce errors, it is preferable to use commands from the `natbib` package to automate the references in the text, as in the following example:

... it has been found (Arthur & Hoare 2006; Baldwin et al. 1991; Dale et al. 2005) that ... following García-Segura & Franco (1996) ... is not true (despite what Strömgren 1939 maintains) ...

See `authorguide.pdf` for more examples and explanation. For the reference keys, one can use the ADS bibliographic code, which is the default for references obtained from ADS. Alternatively, if these prove too hard to remember[5], any mnemonic string may be used.

It is also possible to automate the generation of the reference list itself using BibTeX, but support for this in the macros is still experimental. For further details, see `authorguide.pdf`.

Acknowledgements of grants received, assistance from colleagues, and helpful referees follow the `\acknowledgments` command, which simply adds a bit of vertical space.

[5] There is no need to remember the keys if you use an editor that understands LaTeX references, such as RefTeX mode in emacs.

APPENDIX

A. HOW TO MAKE AN APPENDIX

Appendices come before the references (unlike in some other journals). Each appendix is introduced by a `\section` command, which should be placed inside an `appendices` environment (or an `appendix` environment if there is only one).

REFERENCES

Arthur, S. J., & Hoare, M. G. 2006, ApJ, in press (astro-ph/0511035)
Baldwin, J. A., Ferland, G. J., Martin, P. G., Corbin, M. R., Cota, S. A., Peterson, B. M., & Slettebak, A. 1991, ApJ, 374, 580
Bedijn, P. J., & Tenorio-Tagle, G. 1981, A&A, 98, 85
Bodenheimer, P., Tenorio-Tagle, G., & Yorke, H. W. 1979, ApJ, 233, 85
Carlqvist, P., Gahm, G. F., & Kristen, H. 2003, A&A, 403, 399
Dale, J. E., Bonnell, I. A., Clarke, C. J., & Bate, M. R. 2005, MNRAS, 358, 291
Elmegreen, B. G., & Scalo, J. 2004, ARA&A, 42, 211
Eulderink, F., & Mellema, G. 1995, A&AS, 110, 587
Ferland, G. J. 2000, Revista Mexicana de Astronomía y Astrofísica Conference Series, 9, 153
Franco, J., Tenorio-Tagle, G., & Bodenheimer, P. 1989, Revista Mexicana de Astronomía y Astrofísica, 18, 65
Franco, J., Tenorio-Tagle, G., & Bodenheimer, P. 1990, ApJ, 349, 126
García-Segura, G., & Franco, J. 1996, ApJ, 469, 171
Giuliani, J. L. 1979, ApJ, 233, 280
Henney, W. J. 2006, In: *Diffuse Matter from Star Forming Regions to Active Galaxies: A Volume Honouring John Dyson.* Eds. T. W. Harquist, J. M. Pittard, & S. A. E. G. Falle. (Dordrecht: Springer), in press (astro-ph/0602626)
Henney, W. J., Arthur, S. J., & García-Díaz, M. T. 2005, ApJ, 627, 813
Henney, W. J., Arthur, S. J., Williams, R. J. R., & Ferland, G. J. 2005, ApJ, 621, 328
Hester, J. J., et al. 1996, AJ, 111, 2349
Iliev, I. T., Mellema, G., Pen, U.-L., Merz, H., Shapiro, P. R., & Alvarez, M. A. 2006a, MNRAS, submitted (astro-ph/0512187)
Iliev, I. T., et al. 2006b, MNRAS, submitted (astro-ph/0603199)
Iliev, I. T., et al. 2006c, in preparation (Cosmological Radiative Transfer Code Comparison http://www.mpa-garching.mpg.de/tsu3/)
Kahn, F. D. 1954, Bull. Astron. Inst. Netherlands, 12, 187
Klessen, R. S., Heitsch, F., & Mac Low, M.-M. 2000, ApJ, 535, 887
Lada, C. J., & Lada, E. A. 2003, ARA&A, 41, 57
Larson, R. B. 1981, MNRAS, 194, 809
Li, Y., Mac Low, M.-M., & Abel, T. 2004, ApJ, 610, 339

Mellema, G., Iliev, I. T., Alvarez, M. A., & Shapiro, P. R. 2006, New Astronomy, 11, 374 (astro-ph/0508416)
Moffat, A. F. J., et al. 2002, ApJ, 573, 191
O'Dell, C. R. 2001, ARA&A, 39, 99
O'Dell, C. R., Peimbert, M., & Peimbert, A. 2003, AJ, 125, 2590
O'Dell, C. R., & Yusef-Zadeh, F. 2000, AJ, 120, 382
Panagia, N. 1973, AJ, 78, 929
Pottasch, S. R. 1956, Bull. Astron. Inst. Netherlands, 13, 77
Raga, A. C., Mellema, G., Arthur, S. J., Binette, L., Ferruit, P., & Steffen, W. 1999, Revista Mexicana de Astronomía y Astrofísica, 35, 123
Redman, M. P., Williams, R. J. R., Dyson, J. E., Hartquist, T. W., & Fernandez, B. R. 1998, A&A, 331, 1099
Rho, J., Reach, W. T., Lefloch, B., & Fazio, G. 2005, In: Star Formation in the Era of Three Great Observatories, see http://www.spitzer.caltech.edu/Media/releases/ssc2005-02/ssc2005-02a.shtml
Ryutov, D. D., Kane, J. O., Mizuta, A., Pound, M. W., & Remington, B. A. 2005, Ap&SS, 298, 183
Scowen, P. A., et al. 1998, AJ, 116, 163
Shu, F. H., Lizano, S., Galli, D., Cantó, J., & Laughlin, G. 2002, ApJ, 580, 969
Spitzer, L. 1968, Diffuse Matter in Space, New York: Interscience
Strömgren, B. 1939, ApJ, 89, 526
Sutherland, R. S., Bisset, D. K., & Bicknell, G. V. 2003, ApJS, 147, 187
Tenorio-Tagle, G. 1979, A&A, 71, 59
Tenorio-Tagle, G., Muñoz-Tuñón, C., Pérez, E., Silich, S., & Telles, E. 2006, ApJ, in press (astro-ph/0601631)
Vázquez-Semadeni, E., Ostriker, E. C., Passot, T., Gammie, C. F., & Stone, J. M. 2000, Protostars and Planets IV, 3
Vázquez-Semadeni, E., Ballesteros-Paredes, J., & Klessen, R. S. 2003, ApJ, 585, L131
Vázquez-Semadeni, E., Kim, J., & Ballesteros-Paredes, J. 2005, ApJ, 630, L49
Vázquez-Semadeni, E., Kim, J., Shadmehri, M., & Ballesteros-Paredes, J. 2005, ApJ, 618, 344
Williams, R. J. R. 1999, MNRAS, 310, 789
Williams, R. J. R. 2006, In: *Diffuse Matter from Star Forming Regions to Active Galaxies: A Volume Honouring John Dyson.* Eds. T. W. Harquist, J. M. Pittard, & S. A. E. G. Falle. (Dordrecht: Springer), in press
Williams, R. J. R., & Dyson, J. E. 2001, MNRAS, 325, 293
Williams, R. J. R., Dyson, J. E., & Hartquist, T. W. 2000, MNRAS, 314, 315
Wood, D. O. S., & Churchwell, E. 1989, ApJS, 69, 831

Last Author and Another Collaborator: Instituto de Astronomía, Universidad Nacional Autónoma de México, Apartado Postal 70-264, México, CDMX, C.P. 04510 (la, ac@astro.unam.mx).
William J. Henney: Instituto de Radioastronomía y Astrofísica, Universidad Nacional Autónoma de México, Apartado Postal 3–72, 58090 Morelia, Michoacán, México (w.henney@irya.unam.mx).