

TEX in Astronomical Publishing

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Introduction

The use of the computer typesetting system TEX in astronomical publishing has become inevitable.

In the *Messenger* No. 52, "Astronomy and Astrophysics" first announced the availability of a TEX macro package, which may be used to submit papers intended for publication in the Main Journal. In *Messenger* 56 a repeated call to use the TEX macro package was made, and a TEX package for the A&A Supplement Series was announced. Experiments with TEX for astronomical publishing are also going on in the United States, as abstract No. 32.02 in the *Bulletin of the American Astronomical Society*, Vol. 21, No. 2, shows.

Manuscripts, prepared with the TEX macros, can be fed straight into a type-setting machine at the publisher's, thus eliminating the costly and time consuming steps of having the manuscript typeset and sent back and forth for proofreading. Shifting the burden of typesetting from the publishers to the authors affects the work of authors, editors and publishers to a lesser or greater extent. This is recognized by Dr. H.-U. Daniel as he states in the *Messenger* No. 56, in his renewed call to use the TEX macro packages: "... continuing, patient cooperation will be necessary until the usual smooth processing of manuscripts (...) has been extended to 'electronic' manuscripts."

This paper is intended as a contribution of an author to this continuing cooperation, and I hope it will be read by other authors, editors and publishers. In it, I will raise some matters which did not seem to get much attention in the developments so far, but which may be decisive as to the success or failure of the introduction of TEX for astronomical publishing.

TEX

TEX actually is a programming language, like any other programming language, except that it is not intended for numerical calculations, but for the processing of text. With TEX the data to be processed are the text, and the programme that processes the data formats the text into a desired layout.

The basic idea of TEX in (astronomical) publishing is that the author provides the text and that the publisher provides the TEX programme. Thus the author determines the contents of a paper, and the publisher is in control of the actual appearance of the paper in his journal.

However, since TEX is a programming language, there are many solutions to formatting problems, and there is no end to the features with which a programme could be equipped ("dynamic" numbering of sections, equations, etc.; semi-automatic generation of lists of references). This means that when publishers go about the development of TEX programmes – or macros, as they are actually called – independently, the macros for different journals may also be (very) different. Authors publishing in several journals would

have to learn the different macros used by these journals.

Astronomy and Astrophysics

Sadly, we are already confronted with this problem, and not from two entirely different journals, but from different parts of the same journal.

The TEX macro packages for the Main Journal of A&A and of the Supplement Series were independently developed by their respective publishers: Springer in Germany and Les Editions de Physique in France.

For an author this is a most deplorable situation, especially when he is asked by the Editors to agree to the transfer of his paper from the Main Journal to the Supplement Series, or vice versa.

A Call for Standardization

Astronomical journals all have their own typical appearance and layout. Thus it seems almost unavoidable that different TEX macro packages are needed to meet the typographical requirements of each journal. However, when we look at the underlying structure of the papers in the journals, then they turn out not to be all that different.

The papers in our astronomical journals are characterized by a heading, with the title of the paper and the names and addresses of the authors, a summary or abstract, sections, equations, figures, tables, and a list of references.

It is possible to define TEX commands that deal with this structure of a paper, rather than with its layout. In fact, good typography supports the structure of a text, and the actual layout for any specific journal could be derived from the structuring commands, which really should be the same for all journals. This would alleviate authors from having to learn many different TEX macro packages.

LAT_EX

There already exists a macro package for TEX which may serve as an example of the above-mentioned concept.

LAT_EX is a general-purpose macro package for TEX, developed by Leslie Lamport. It provides authors with the tools to produce typographically sound articles, books, reports, and letters, without the need to learn the entire, complex language of TEX.

LAT_EX commands mainly deal with the structure of a document, while the actual layout of the document is determined by a so-called style file. LAT_EX thus allows the author to fully concentrate on the writing, and not to be concerned about where and how things are to be put on paper.

The LAT_EX style files may be adapted to produce the same source text in any desired layout, in a virtually endless choice of fonts. This means that a paper prepared with LAT_EX can be adapted to the typographical requirements of any specific journal, simply

by making the right adjustments to the style files.

LAT_EX has many other interesting facilities. These have been recognized by (astronomical) authors, which is illustrated by the fact that many already use LAT_EX for their own purposes. One of the interesting facilities of LAT_EX is the semi-automatic compilation of lists of references from a bibliographic database, when it is used together with a programme called BIB_TEX.

Fortunately, the advantages of LAT_EX have been recognized by the publisher of the Main Journal of A&A, Springer in Germany, and we may look forward to a first release of an A&A LAT_EX style file before the end of this year.

TEX and WYSIWYG word processors

Not every author is happy about the concept of TEX, where one has to prepare a source text, compile it with TEX and then print it to, at long last, see the final result.

Many prefer a WYSIWYG (What You See Is What You Get) word processor, and this preference is perfectly legitimate, because there are some very powerful interactive word processors around, capable of handling mathematical texts.

For astronomical publishing those word processors which are capable of producing TEX output are interesting, because for some time to come TEX will be the only thing the typesetting machines at the publishers' are able to handle.

Examples of WYSIWYG word processors with a TEX interface are MATHOR for the IBM PC and compatibles, and MathType for the Apple Macintosh. The publisher of the Supplement Series of A&A, Les Editions de Physique in France, provide a MATHOR-TEX interface to prepare papers for publication in their journal.

Concluding Remarks

The introduction of TEX in astronomical publishing is intended to increase the efficiency with which the astronomical journals can be run. With the above, I hope to have made clear that this can only be achieved if the authors are provided with tools that allow them to efficiently produce manuscripts in TEX.

Efficiency on the part of authors can be achieved in two ways, through standardization of TEX macros for the various astronomical journals, and by providing TEX interfaces for preferred mathematical word processors.

Standardization of TEX macros can be realized through the joint development of a standard macro, or by adopting the general purpose macro package LAT_EX, which to a great extent could serve as a standard.

In the end, publishers will also benefit from a form of standardization as advocated here, because when the output of a "standard" word processor is widely accepted, more authors will be apt to learn and use that word

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processor (or T_EX macro package, for that matter).

It is a great pity that Astronomy and Astrophysics appears thus far not to have recognized these aspects about T_EX in astronomical publishing, a fact which is indicated by the two widely different macro packages for their Main Journal and their Supplement Series. However, the experiments of Springer with L^AT_EX, and those of Les Editions de Physique with Mathor, hold promises for the future.

It is a pleasure to report that the matter of standardization has been recognized early in the developments with T_EX for The Astrophysical Journal and for The Astronomical Journal.

Many aspects mentioned in this paper have also been put forward in a poster pre-

sented at a meeting of the American Astronomical Society, by C.D. Biemesderfer of the National Radio Astronomy Observatory and R.J. Hanisch of the Space Telescope Science Institute.

References

- Biemesderfer, C.D. and Hanisch, R.J.: "T_EX and L^AT_EX Macro Definition Files for Astronomical Publishing", *Bulletin of the American Astronomical Society*, Vol. 21, No. 2, 1989.
- Daniel, H.-U., Berger, J. and Savaray, D.: "T_EX and Mathor3-T_EX for Astronomy and Astrophysics Journal and Supplement Series", *The Messenger* No. 56, 1989.
- Knuth, D.: "The T_EXbook", Addison-Wesley, Reading Massachusetts, 1984.
- Lampert, L.: "L^AT_EX, A Document Preparation System", Addison-Wesley, Reading, Massachusetts, 1986.

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