to T_EX and L^AT_EX Macro Definition Files for Astronomical Publications

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As astronomers have become skilled in the use of the typesetting programs T_EX and L^AT_EX, their use in preparing articles for astronomical journals has steadily increased. We believe that the community, including the journal publishers, can benefit significantly from the adoption of T_EX for production purposes as well as for the creation of authors' drafts. We have begun the development of macro definition files for the Chicago University Press journals (*Ap.J.* and *A.J.*), and have developed templates which guide authors in the preparation of their manuscripts.

We wish to illustrate several points with our display:

- High-quality output can be produced, even with a 300 dot per inch laser printer.

- There is merit in the use of a "general" set of macros, usable by several authors, in order to produce identical *looking* results (identical form vs. variable content).

- We demonstrate the power of the typesetting system itself, and the versatility possible with layers of macros, with "draft" and "reprint" versions of the same paper produced *with the same markup* (variable form vs. identical content).

Why use T_EX ?

Look around. How many presentations and preprints that were prepared with T_EX have you seen at this meeting ? The most important reason for selecting these programs is *familiarity*. Another consideration is that the whole T_EX system is in the public domain, so there is very little encumbrance of cost levied on the community. The system has been ported to a significant fraction of available computing machinery and printers, so the likelihood of requiring the acquisition of new hardware is very small.

In addition, T_EX and L^AT_EX do typesetting *well*. They are capable of producing printed manuscripts that are practically indistinguishable from the printed pages of the various journals. Finally, T_EX has a well-developed macro facility. Through the use of standard macro files, it is possible for authors to send their manuscripts electronically to the journal editorial offices and for the journals to reduce costs by directly typesetting the submissions. Given the widening of the research computing network, it is easy to imagine that publishers need not produce final-copy reprints for authors to distribute; the bulk of reprint requests could be made *and filled* via electronic mail.

Why use macros ?

The most important reason to use identical markup is to guarantee uniformity in the typeset results of manuscripts written by different authors. A secondary benefit is that by changing the *definitions* of the markup macros, an author (or publisher) can produce articles with entirely different form, without modifying the source document. This means that an author can create an "editorial" copy of a paper suitable for review

by a referee or a copy editor, and the journal publisher can produce "proof" pages (or the author can produce his own reprints) with the same markup.

The accompanying figures show the original source files and typeset results of a trial article produced in "draft" and "final" forms.

With the use of $\mathrm{L^AT_EX}$ style files, the macro definitions can also be customized for the style differences between the different journals. Although we encourage the standardization efforts now in progress, if differences were to remain in the layout, font styles, references, etc., between different journals, these could be accommodated in suitably tailored style files. Again, the source text would be identical except for the name of the style file.

Macro names

Proposing a "standard" for a community at large is always a contentious undertaking, and there will undoubtedly be differences of opinion about the nomenclature of the markup and the semantics of the "little language" that comprises the definitions. We have adopted the naming conventions and to a major extent the semantics of $\mathrm{L^AT_EX}$, primarily because the control sequence names of $\mathrm{L^AT_EX}$ reflect the canonical terminology of typography and copy editing. $\mathrm{L^AT_EX}$ is also widely used, and many scientists are likely to be familiar with the command names.

We list in what follows the major features of the experimental *apj* style definition.

- Journal and article identification information is established by the editorial staff. The following macros can (and probably should) be included in the manuscript preamble.

    ```
    \journalid{VOL}{JOURNALDATE}
    \articleid{STARTPAGE}{ENDPAGE}
    \received{RECEIPTDATE}
    \accepted{ACCEPTDATE}
    ```

    The copyright line found at the beginning of each article is typeset using the journal and article identification information set by the `\journalid` and `\articleid` commands.

- Title and author identification is by way of standard $\mathrm{L^AT_EX}$ commands `\title` and `\author`.

    ```
    \title{TITLE}
    \author{AUTHOR}
    ```

    Authors' principal affiliation(s) is specified with a separate macro `\affiliation`. Authors often have affiliations above and beyond their main

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employer, and these are specified with the `\altaffil` and `\altaffiltext` commands.

```
\affiliation{PLACE}
\altaffil{IDNUMBER}
\altaffiltext{IDNUMBER}{PLACE}
```

- The paper abstract is enclosed in a grouping construct as per the $\mathrm{L^AT_EX}$ abstract environment. There is also a subject headings environment that permits main headings with subheadings, identified with `\heading` and `\subheading` macros, respectively.

```
\begin{abstract}
\end{abstract}

\begin{subjects}
\heading{MAINTOPIC}
\subheading{SUBTOPIC}
\end{subjects}
```

- We permit sections, subsections, and subsubsections as described by the Manual of Style, and using the same syntax as their paradigms in $\mathrm{L^AT_EX}$.

```
\section{NAME}
\subsection{NAME}
\subsubsection{NAME}
```

- There is an `\acknowledgements` command to be used before any final paragraphs that may contain expressions of gratitude.

```
\acknowledgements
```

- At the present time, the references environment is not implemented with $\mathrm{BIBT_EX}$, although we borrow syntactic and semantic ideas from that system (which, in turn, borrows from Scribe and *refer*). We have simply defined the several macros we needed for the sample papers, using the entry types described in the $\mathrm{BIBT_EX}$ documentation. The definitions make use of the required and optional fields as per $\mathrm{BIBT_EX}$ as well, and the required arguments are in the same order as they are mentioned in Appendix B of the

L^AT_EX manual. We have added the optional arguments where necessary in order to make correct *Ap.J.* references, although the specific syntax may not be desirable for authors submitting to many journals; something more general should be devised, or else BIBT_EX should be properly used.

```
\begin{references}
\article{AUTHOR}{TITLE}{JOURNAL}{YEAR}
{VOL}{PAGE}
\book{AUTHOR}{TITLE}{PUBLISHER}{YEAR}
\inbook{AUTHOR}{TITLE}{CHAP/PAGE}{ED/
PUB}{YEAR}
\misc{AUTHOR}{YEAR}{NOTE}
\end{references}
```

- There is an authors' addresses environment. The syntax here is experimental.

```
\begin{authoraddresses}
\authoraddress{NAME}{ADDRESS}
\end{authoraddresses}
```

where address components should be delimited by \\. For *Ap.J.* main journal addresses, \\ doesn't mean a line break; it is redefined to be simply a comma. In preprints, though, people frequently set up their addresses in a standard "envelope" form, hence that choice for the delimiter.

We also suggest that a number of commonplace abbreviations be specified as macros, particularly for the names of journals used in citations. The reason for this is because different journals do not use the same abbreviations, and if the ideas proposed in this paper catch on with several publishers, we can use the same citation macros without having to look up in the corresponding Manual of Style how to abbreviate *Astronomy and Astrophysics*.

Status of the macros

The macro package is in a very preliminary form, with many known shortcomings and omissions; the purpose of this paper is to serve as a trial balloon for the concepts we are proposing.

There are several outstanding problems, most notably a generalized way of going in and out of "two-column" mode. Macros for setting tabular material and for inserting space for figures have not been developed (although they will not be terribly difficult). The most flexible way to handle embedded graphical material is for the graphics to be submitted in electronic form also, in some standard metacode such as PostScript, but this is a separate issue.