An example *Geophysics* article,

with a two-line title

(October 6, 2021)

GEO-Example

Running head: *Geophysics* example

**ABSTRACT**

This is an example of using `geophysics.cls` for writing *Geophysics* papers.
INTRODUCTION

This is an introduction. L\TeX is a powerful document typesetting system (Lamport, 1994). An excellent reference is (Kopka and Daly, 2004). The new \texttt{geophysics.cls} class complies with the L\TeX2e standard. We had something else written here but decided to get rid of it.

THEORY

This is another section.

Equations

Section headings should be capitalized. Subsection headings should only have the first letter of the first word capitalized.

Here are examples of equations involving vectors and tensors:

\[
\mathbf{R} = \begin{pmatrix} R_{XX} & R_{YX} \\ R_{XY} & R_{YY} \end{pmatrix} = \mathbf{P}_{M\rightarrow R} \mathbf{D} \mathbf{P}_{S\rightarrow M} \mathbf{S},
\]  

(1)

and

\[
R_{j,m}(\omega) = \sum_{n=1}^{N} P_j^{(n)}(x_R) D^{(n)}(\omega) P_m^{(n)}(x_S).
\]

(2)

Note that the macro for the \texttt{\textbackslash\texttt{tensor}} command has been changed to force tensors to be bold uppercase, in compliance with current SEG submission standards. This is so that documents typeset to the old standards will print out according to the new ones: e.g., tensor $\mathbf{T}$ (note converted to uppercase).
Figures

Figure 1 shows what it is about.

Multiplot

Sometimes it is convenient to put two or more figures from different files in an array (see Figure 2). Individual plots are Figures 2a and 2b.

The first argument of the multiplot command specifies the number of plots per row.

Tables

The discussion is summarized in Table 1.

APPENDIX A

APPENDIX EXAMPLE

According to the new SEG standard, appendices come before references.

\[
\frac{\partial U}{\partial z} = \left\{ \sqrt{\frac{1}{v^2} - \left[ \frac{\partial t}{\partial g} \right]^2} + \sqrt{\frac{1}{v^2} - \left[ \frac{\partial t}{\partial s} \right]^2} \right\} \frac{\partial U}{\partial t} \quad (A-1)
\]

It is important to get equation A-1 right. See also Appendix B.
APPENDIX B

ANOTHER APPENDIX

\[
\frac{\partial U}{\partial z} = \left\{ \frac{1}{v^2} - \left[ \frac{\partial t}{\partial g} \right]^2 + \frac{1}{v^2} - \left[ \frac{\partial t}{\partial s} \right]^2 \right\} \frac{\partial U}{\partial t}
\] (B-1)

Too lazy to type a different equation but note the numeration.

The error comparison is provided in Figure B-1.

APPENDIX C

THE SOURCE OF THIS DOCUMENT
This is an example of using \textsf{geophysics.cls} for writing \textit{Geophysics} papers.
\begin{abstract}

\section{Introduction}

This is an introduction. \LaTeX\ is a \new{powerful} document typesetting system \cite\{lamport\}. An excellent reference is \cite\{kopka\}. The new \textsf{geophysics.cls} class complies with the \LaTeX2e\ standard. \old{We had something else written here but decided to get rid of it}.

\section*{Theory}

This is another section.

\subsection{Equations}

Section headings should be capitalized. Subsection headings should only have the first letter of the first word capitalized.

Here are examples of equations involving vectors and tensors:

\begin{equation}
\begin{pmatrix}
R_{XX} & R_{YX} \\
R_{XY} & R_{YY}
\end{pmatrix}
\end{equation}

\[
\begin{align*}
\mathbf{P}_{M \rightarrow R} \; \mathbf{D} \; \mathbf{P}_{S \rightarrow M} \\
\label{SVD}
\end{align*}
\]

and
\[
\begin{align*}
R_{j,m}(\omega) &= \\
= \sum_{n=1}^{N} \mathbf{P}_{j}^{(n)}(\mathbf{x}_R) \; \mathbf{D}^{(n)}(\omega) \; \mathbf{P}_{m}^{(n)}(\mathbf{x}_S) \\
\label{SVDray}
\end{align*}
\]

Note that the macro for the \verb|#tensor|# command has been changed to force tensors to be bold uppercase, in compliance with current SEG submission standards. This is so that documents typeset to the old standards will print out according to the new ones: e.g., tensor $\mathbf{t}$ (note converted to uppercase).

\subsection*{Figures}
\renewcommand{\figdir}{Fig} % figure directory

\section*{Figures}
\renewcommand{\figdir}{Fig} % figure directory
Figure~\ref{fig:waves} shows what it is about.

\plot{waves}{width=\textwidth}

{This figure is specified in the document by \texttt{
\backslash\texttt{{\backslash\texttt{plot\{waves\}\{width=\backslash\texttt{textwidth}\}}}{{This caption.}}}.}

\subsubsection{Multiplot}

Sometimes it is convenient to put two or more figures from different files in an array (see Figure~\ref{fig:exph,exgr}). Individual plots are Figures~\ref{fig:exph} and~\ref{fig:exgr}.

\multiplot{2}{exph,exgr}{width=0.4\textwidth}

{This figure is specified in the document by \texttt{
\backslash\texttt{{\backslash\texttt{multiplot\{2\}\{exph,exgr\}\{width=0.4\backslash\texttt{textwidth}\}}}{{This caption.}}}.}

The first argument of the \texttt{multiplot} command specifies the number of plots per row.

\subsection{Tables}
The discussion is summarized in Table~\ref{tbl:example}.

\tabl{example}{This table is specified in the document by \texttt{\backslash	bl\{example\}\{This caption.\}\{\ldots\}}}.

\begin{center}
\begin{tabular}{|c|c|c|}
\hline
migration \rule[-2ex]{0ex}{5ex} & $\omega \rightarrow k_z$ & $k_y^2+k-z^2\cos^2 \psi=4\omega^2/v^2$ \\
\hline
zero-offset\,diffraction \rule[-4ex]{0ex}{8ex} & $k_z\rightarrow\omega_0$ & $k_y^2+k_z^2=4\omega_0^2/v^2$ \\
\hline
DMO+NMO \rule[-2ex]{0in}{5ex} & $\omega\rightarrow\omega_0$ & $\frac{1}{4}v^2k_y^2\sin^2\psi+\omega_0^2\cos^2\psi=\omega^2$ \\
\hline
\end{tabular}
\end{center}
\begin{tabular}{lll}
radial DMO & $\omega \rightarrow \omega_s$ & \frac{1}{4}v^2k_y^2\sin^2\psi+\omega_s^2=\omega^2$\\
\hline
radial NMO & $\omega_s \rightarrow \omega_0$ & $\omega_0\cos\psi=\omega_s$\\
\hline
\end{tabular}

\begin{acknowledgments}
I wish to thank Ivan Pšenčík and Frédéric Billette for having names with non-English letters in them. I wish to thank
\cite{Cerveny} for providing an example of how to make a bib file that includes an author whose name begins with a non-English character and \cite{forgues96} for providing both an example of referencing a Ph.D. thesis and yet more non-English characters.
\end{acknowledgments}

\append{Appendix example}

\label{example}

According to the new SEG standard, appendices come before references.
It is important to get equation~\ref{eqn:partial} right. See also Appendix~\ref{equations}.

\begin{equation}
\frac{\partial U}{\partial z} = \left\{ \sqrt{\frac{1}{v^2} - \left[ \frac{\partial t}{\partial g} \right]^2} + \sqrt{\frac{1}{v^2} - \left[ \frac{\partial t}{\partial s} \right]^2} \right\} \frac{\partial U}{\partial t}
\label{eqn:partial2}
\end{equation}
Too lazy to type a different equation but note the numeration.

The error comparison is provided in Figure~\ref{fig:errgrp}.

\sideplot{errgrp}{width=0.8\textwidth}

{This figure is specified in the document by \texttt{
    \sideplot{errgrp}{width=0.8\textwidth}}\{This caption.\}}

\append{The source of this document}

\verbatiminput{geophysicsexample.ltx}

\append{The source of the bibliography}

\verbatiminput{example.bib}

\begin{thebibliography}{10}

\bibliographystyle{seg}  % style file is seg.bst
\bibliography{example}

\end{thebibliography}
APPENDIX D
THE SOURCE OF THE BIBLIOGRAPHY

@Book{lamport,
    author = {L[eslie] Lamport},
    title = {{\LaTeX: A} Document Preparation System},
    publisher = {Addison-Wesley},
    year = 1994
}

@Book{kopka,
    author = {H[elmut] Kopka and P[atrick] W[] Daly},
    title = {Guide to {{\LaTeX}}},
    publisher = {Addison-Wesley},
    year = 2004
}

@preamble{"\newcommand{\SortNoop}[1]{}

@Book{Cerveny,
    author = {V[ ] \SortNoop{Cerveny}\v{C}erven\'y},

title = {Seismic Ray Method},
year = {2000},
publisher = {Cambridge University Press}
}

@PHDTHESIS{forgues96,
author = {E. Forgues},
title = {Inversion linéarisée multi-paramètres via la théorie des raies},
school = {Institut Français du Pétrole - University Paris VII},
year = {1996}
}
REFERENCES


LIST OF TABLES

1 This table is specified in the document by \texttt{\tabl{example}{This caption.}{...}}.
LIST OF FIGURES

1. This figure is specified in the document by \plot{waves}{width=\textwidth}{This caption.}.

2. This figure is specified in the document by \multiplot{2}{exph,exgr}{width=0.4\textwidth}{This caption.}.

B-1 This figure is specified in the document by \sideplot{errgrp}{width=0.8\textwidth}{This caption.}. 
Figure 1: This figure is specified in the document by
\plot{waves}{width=\textwidth}{This caption.}.

GEO-Example
Figure 2: This figure is specified in the document by
\texttt{\multiplot{2}{exph,exgr}{width=0.4\textwidth}{This caption.}}.

GEO-Example
Table Example

<table>
<thead>
<tr>
<th>Method</th>
<th>Equation Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>migration</td>
<td>$\omega \rightarrow k_z \quad k_y^2 + k - z^2 \cos^2 \psi = 4\omega^2/v^2$</td>
</tr>
<tr>
<td>zero-offset</td>
<td>$k_z \rightarrow \omega_0 \quad k_y^2 + k_z^2 = 4\omega_0^2/v^2$</td>
</tr>
<tr>
<td>diffraction</td>
<td>$k_z \rightarrow \omega_0 \quad k_y^2 + k_z^2 = 4\omega_0^2/v^2$</td>
</tr>
<tr>
<td>DMO+NMO</td>
<td>$\omega \rightarrow \omega_0 \quad \frac{1}{4}v^2k_y^2 \sin^2 \psi + \omega_0^2 \cos^2 \psi = \omega^2$</td>
</tr>
<tr>
<td>radial DMO</td>
<td>$\omega \rightarrow \omega_s \quad \frac{1}{4}v^2k_y^2 \sin^2 \psi + \omega_s^2 = \omega^2$</td>
</tr>
<tr>
<td>radial NMO</td>
<td>$\omega_s \rightarrow \omega_0 \quad \omega_0 \cos \psi = \omega_s$</td>
</tr>
</tbody>
</table>

Table 1: This table is specified in the document by \tabl{example}{This caption.}{...}. 
Figure B-1: This figure is specified in the document by \sideplot{errgrp}{width=0.8\textwidth}{This caption.}.