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. LaTeX is a *powerful* document typesetting system (Lamport, 1994). An excellent reference is (Kopka and Daly, 2004). The new geophysics.cls class complies with the LaTeX2e 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:

$$\mathbf{R} = \begin{pmatrix} R_{\mathrm{XX}} & R_{\mathrm{YX}} \\ R_{\mathrm{XY}} & R_{\mathrm{YY}} \end{pmatrix} = \mathbf{P}_{M\to R}\,\mathbf{D}\,\mathbf{P}_{S\to M} \quad \mathbf{S} \quad , \tag{1}$$

and

$$R_{j,m}(\omega) = \sum_{n=1}^{N} P_j^{(n)}(\mathbf{x}_R)\; D^{(n)}(\omega)\; P_m^{(n)}(\mathbf{x}_S) \quad . \tag{2}$$

Note that the macro for the `\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.

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

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

APPENDIX B

ANOTHER APPENDIX

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

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

```
%\documentclass[paper]{geophysics}

\documentclass[manuscript,revised]{geophysics}


% An example of defining macros

\newcommand{\rs}[1]{\mathstrut\mbox{\scriptsize\rm #1}}

\newcommand{\rr}[1]{\mbox{\rm #1}}


\begin{document}


\title{An example \emph{Geophysics} article, \\ with a two-line title}


\renewcommand{\thefootnote}{\fnsymbol{footnote}}
```

```
\ms{GEO-Example} % manuscript number

\address{
\footnotemark[1]BP UTG, \\
200 Westlake Park Blvd, \\
Houston, TX, 77079 \\
\footnotemark[2]Bureau of Economic Geology, \\
John A. and Katherine G. Jackson School of Geosciences \\
The University of Texas at Austin \\
University Station, Box X \\
Austin, TX 78713-8924}
\author{Joe Dellinger\footnotemark[1] and Sergey Fomel\footnotemark[2]}

\footer{Example}
\lefthead{Dellinger \& Fomel}
\righthead{\emph{Geophysics} example}

\maketitle

\begin{abstract}
  This is an example of using \textsf{geophysics.cls} for writing
  \emph{Geophysics} papers.
```

```
\end{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}
\tensor{R} =
\pmatrix{R_{\rs{XX}} & R_{\rs{YX}} \cr R_{\rs{XY}} & R_{\rs{YY}}}
```

```
=

\tensor{P}_{M\rightarrow R} \; \tensor{D} \; \tensor{P}_{S\rightarrow M}

\;\;\; \tensor{S} \ \ \ ,

\label{SVD}

\end{equation}

and

\begin{equation}

R_{j,m}(\omega) =

\sum_{n=1}^{N} \, \,

P_{j}^{(n)}(\mathbf{x}_R) \, \,

D^{(n)}(\omega) \, \,

P_{m}^{(n)}(\mathbf{x}_S) \ \ \ .

\label{SVDray}

\end{equation}


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

$\tensor{t}$ (note converted to uppercase).


\subsection*{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{
    $\backslash$plot\{waves\}\{width=$\backslash$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 \newline \texttt{
    $\backslash$multiplot\{2\}\{exph,exgr\}\{width=0.4$\backslash$textwidth\}\{This c
}

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{
    $\backslash$tabl\{example\}\{This caption.\}\{\ldots\}.
}{
  \begin{center}
    \begin{tabular}{|c|c|c|}
      \hline
      \multicolumn{3}{|c|}{Table Example} \\
      \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
      \parbox{1in}{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
```

```
      radial DMO\rule[-2ex]{0in}{5ex} & $\omega\rightarrow\omega_s$ &
      $\frac{1}{4}v^2k_y^2\sin^2\psi+\omega_s^2=\omega^2$\\
      \hline
      radial NMO\rule[-2ex]{0in}{5ex} & $\omega_s\rightarrow\omega_0$ &
      $\omega_0\cos\psi=\omega_s$\\
      \hline
    \end{tabular}
  \end{center}
}

\begin{acknowledgments}
  I wish to thank Ivan P\v{s}en\v{c}\'{\i}k and Fr\'ed\'eric 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.
```

```
\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:partial}
\end{equation}
It is important to get equation~\ref{eqn:partial} right. See also
Appendix~\ref{equations}.

\append[equations]{Another appendix}

\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{

    $\backslash$sideplot\{errgrp\}\{width=0.8$\backslash$text\-width\}\{This caption.

}


\append{The source of this document}


\verbatiminput{geophysics_example.ltx}


\append{The source of the bibliography}


\verbatiminput{example.bib}


\newpage


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

\bibliography{example}
```

```
\end{document}
```

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 linearis\'ee multi-param\'etres via la th\'eorie des rais},
  school = {Institut Fran\c{c}ais du P\'etrole - University Paris VII},
  year   = {1996}
}
```

REFERENCES

Kopka, H., and P. W. Daly, 2004, Guide to LaTeX: Addison-Wesley.

Lamport, L., 1994, LaTeX: A document preparation system: Addison-Wesley.

LIST OF TABLES

LIST OF FIGURES

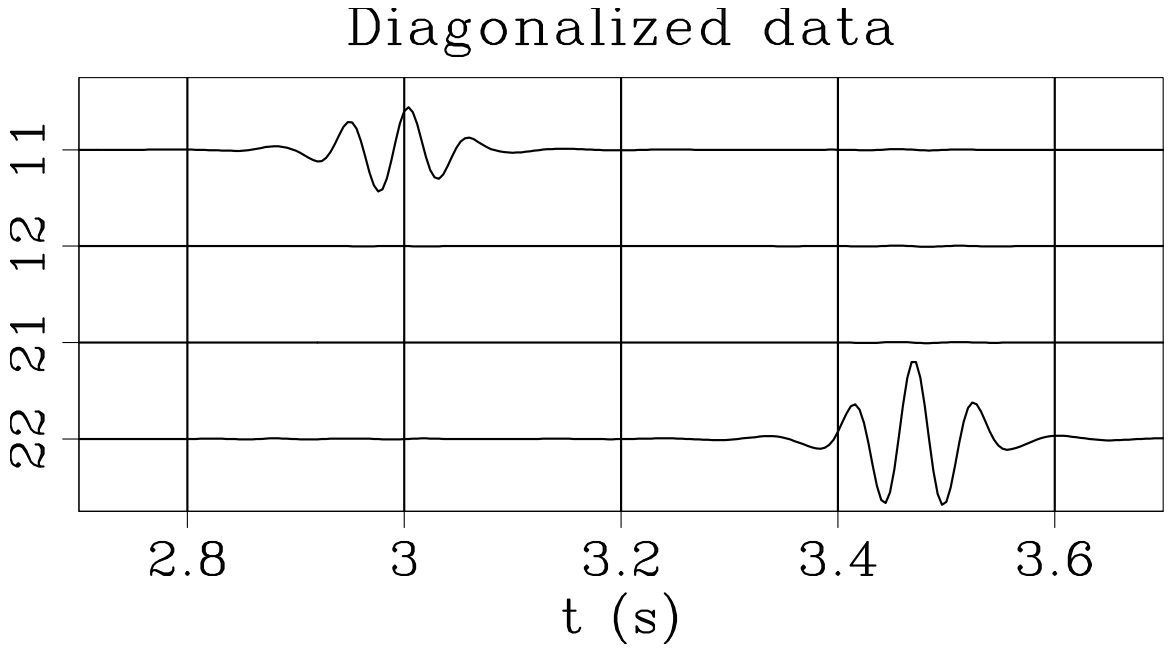
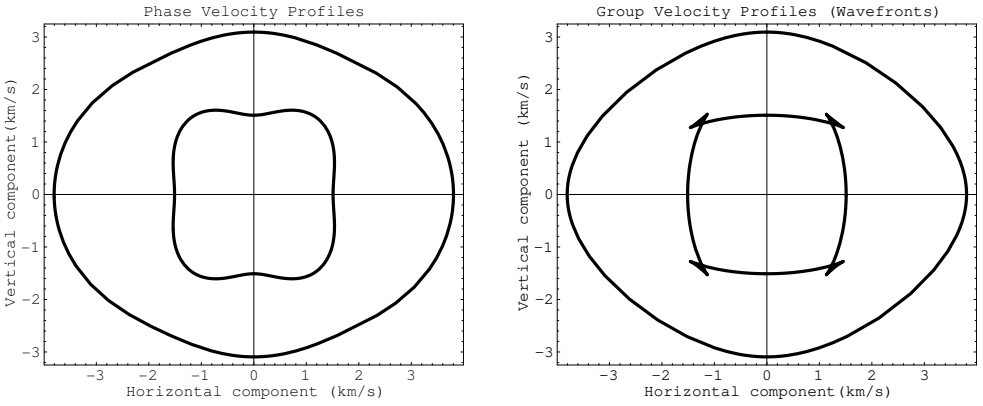


Figure 1: This figure is specified in the document by `\plot{waves}{width=\textwidth}{This caption.}`.

GEO-Example



(a) (b)

Figure 2: This figure is specified in the document by

`\multiplot{2}{exph,exgr}{width=0.4\textwidth}{This caption.}`.

GEO-Example

Table Example		
migration	$\omega \rightarrow k_z$	$k_y^2 + k - z^2 \cos^2 \psi = 4\omega^2/v^2$
zero-offset diffraction	$k_z \rightarrow \omega_0$	$k_y^2 + k_z^2 = 4\omega_0^2/v^2$
DMO+NMO	$\omega \rightarrow \omega_0$	$\frac{1}{4}v^2 k_y^2 \sin^2 \psi + \omega_0^2 \cos^2 \psi = \omega^2$
radial DMO	$\omega \rightarrow \omega_s$	$\frac{1}{4}v^2 k_y^2 \sin^2 \psi + \omega_s^2 = \omega^2$
radial NMO	$\omega_s \rightarrow \omega_0$	$\omega_0 \cos \psi = \omega_s$

Table 1: This table is specified in the document by `\tabl{example}{This caption.}{...}`.

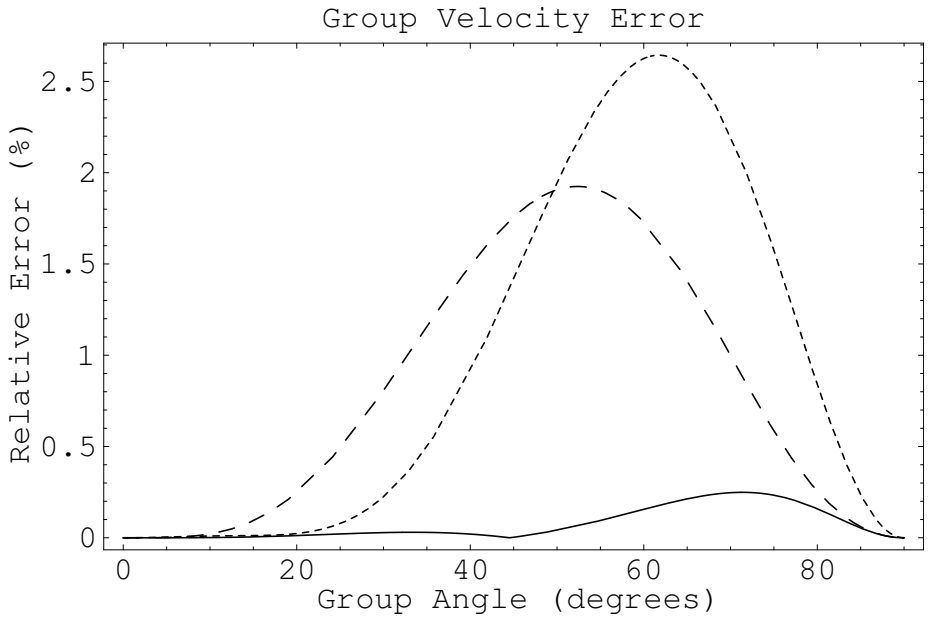


Figure B-1: This figure is specified in the document by \sideplot{errgrp}{width=0.8\textwidth}{This caption.}.

GEO-Example