An example *Geophysics* article,

with a two-line title

(March 3, 2020)

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.

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` commands 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.

[Figure 1 about here.]

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

[Figure 2 about here.]

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

Tables

The discussion is summarized in Table 1.

[Table 1 about here.]

ACKNOWLEDGMENTS

APPENDIX A

APPENDIX EXAMPLE

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

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

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

APPENDIX B

ANOTHER APPENDIX

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

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

The error comparison is provided in Figure 3.

[Figure 3 about here.]

APPENDIX C

THE SOURCE OF THIS DOCUMENT

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

\documentclass[manuscript,endfloat]{geophysics}

\usepackage{graphicx}

\usepackage{subfigure}


% 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}}


\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
```

```latex
\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 powerful document typesetting

system \cite[]{lamport}. An excellent reference is \cite[]{kopka}. The

new \textsf{geophysics.cls} class complies with the \LaTeX2e\

standard.


\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 `\tensor` commands 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).

Figures

Figure~\ref{fig:waves} shows what it is about.

```
\begin{figure}

  \includegraphics[width=\textwidth]{Fig/waves}

  \caption{First caption.}

  \label{fig:waves}

\end{figure}
```

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}.

```
\begin{figure}

  \centering

  \subfigure[]{\includegraphics[width=0.4\textwidth]{Fig/exph}\label{fig:exph}}

  \subfigure[]{\includegraphics[width=0.4\textwidth]{Fig/exgr}\label{fig:exgr}}

  \caption{Second caption}

  \label{fig:exph,exgr}

\end{figure}
```

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}.

```
\begin{table}

  \centering

  \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}

  \caption{Table caption}

  \label{tbl:example}
\end{table}



\section{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.



\append{Appendix 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\}
```

```latex
\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}.

```latex
\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}.

```latex
\begin{figure}

  \centering

  \includegraphics[width=0.8\textwidth]{Fig/errgrp}
```

```
  \caption{Third caption}

  \label{fig:errgrp}

\end{figure}


\append{The source of this document}


\verbatiminput{geophysics_endfloat.tex}


\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

Červený, V., 2000, Seismic ray method: Cambridge University Press.

Forgues, E., 1996, Inversion linearisée multi-paramètres via la théorie des rais: PhD thesis, Institut Français du Pétrole - University Paris VII.

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

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

LIST OF FIGURES
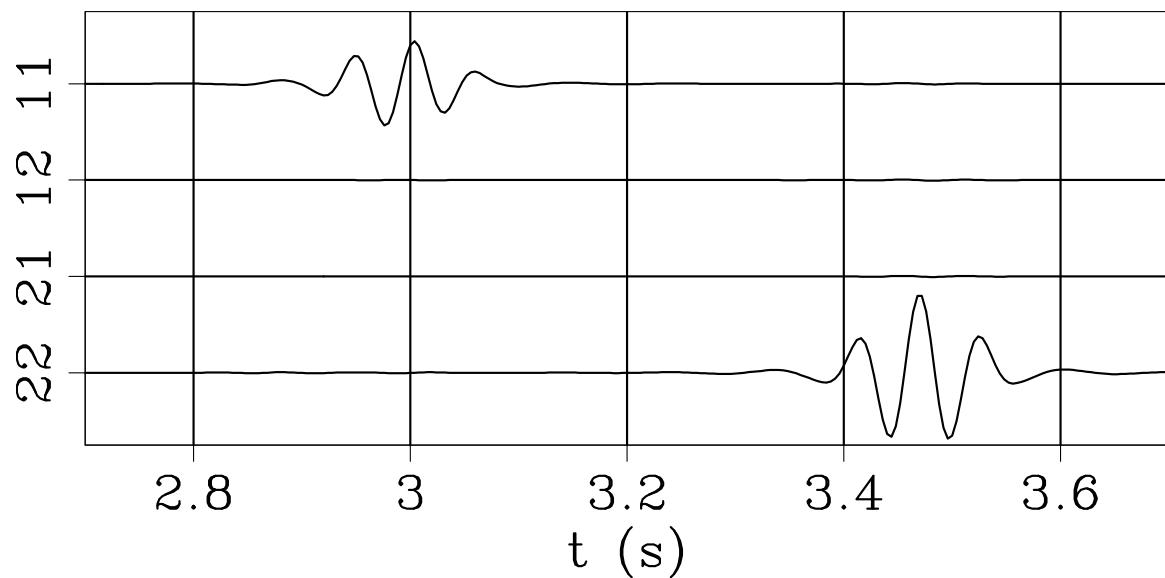
Figure 1: First caption.
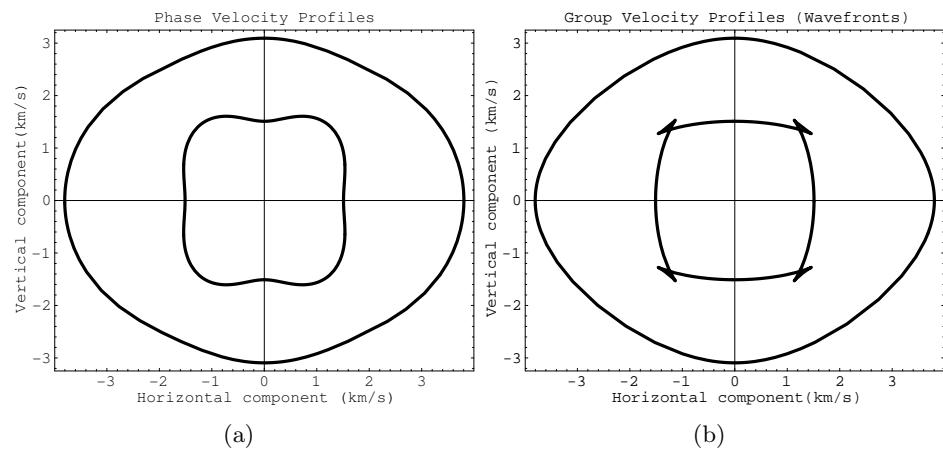
Figure 2: Second caption
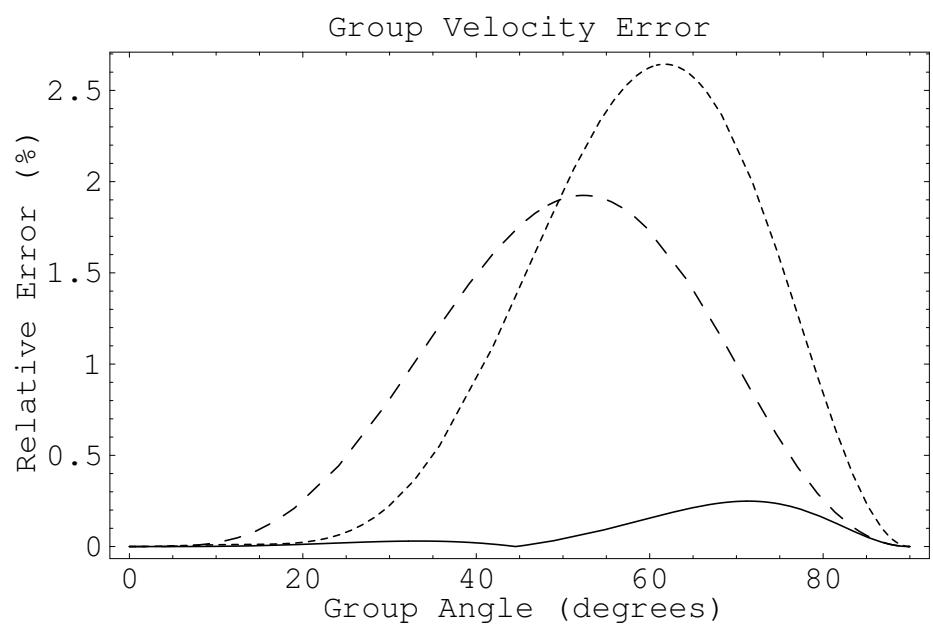
Figure 3: Third caption

LIST OF TABLES

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

Table 1: Table caption