

An example *Geophysics* article,
with a two-line title

(September 14, 2021)

Running head: *Geophysics* example

ABSTRACT

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

INTRODUCTION

This is an introduction. L^AT_EX is a powerful document typesetting system (Lamport, 1994). An excellent reference is (Kopka and Daly, 2004). The new `geophysics.cls` class complies with the L^AT_EX2e 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:

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

and

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

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 **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

I wish to thank Ivan Pšenčík and Frédéric Billette for having names with non-English letters in them. I wish to thank Červený (2000) for providing an example of how to make a bib file that includes an author whose name begins with a non-English character and Forgues (1996) for providing both an example of referencing a Ph.D. thesis and yet more non-English characters.

APPENDIX A

APPENDIX EXAMPLE

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

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

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

APPENDIX B

ANOTHER APPENDIX

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

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, 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 $\boldsymbol{\text{\tensor{t}}}$ (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}.

```
\tbl{example}{This table is specified in the document by \texttt{
```

```
  $\backslash$tbl\{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
DM0+NM0 \rule[-2ex]{0in}{5ex} & $ \omega \rightarrow \omega_0 $ &
$ \frac{1}{4} v^2 k_y^2 \sin^2 \psi + \omega_0^2 \cos^2 \psi = \omega^2 $ \\
\hline
radial DM0 \rule[-2ex]{0in}{5ex} & $ \omega \rightarrow \omega_s $ &
$ \frac{1}{4} v^2 k_y^2 \sin^2 \psi + \omega_s^2 = \omega^2 $ \\
\hline
radial NM0 \rule[-2ex]{0in}{5ex} & $ \omega_s \rightarrow \omega_0 $ &
$ \omega_0 \cos \psi = \omega_s $ \\
\hline
\end{tabular}
\end{center}
}

```

\section{ACKNOWLEDGMENTS}

I wish to thank Ivan P\{s}en\{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}
```

```
\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{Cervený,
  author = {V[] {\SortNoop{Cervený}}\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 L^AT_EX: Addison-Wesley.

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

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Diagonalized data

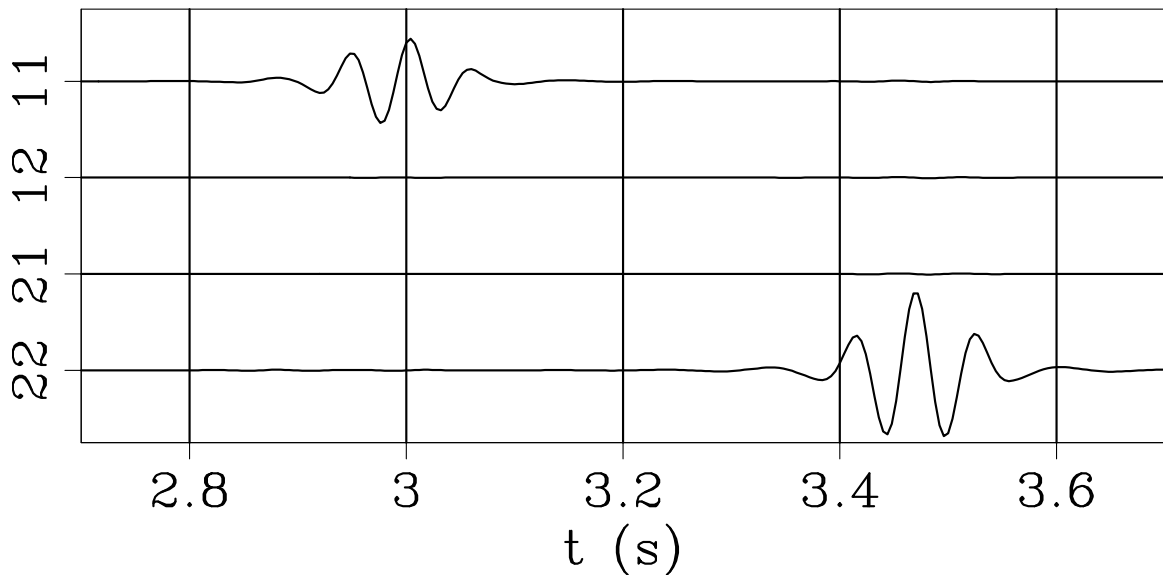


Figure 1: First caption.

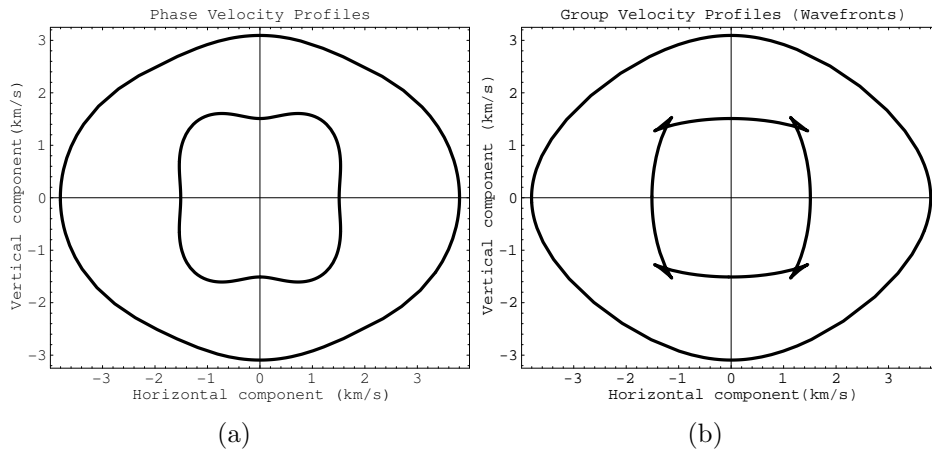


Figure 2: Second caption

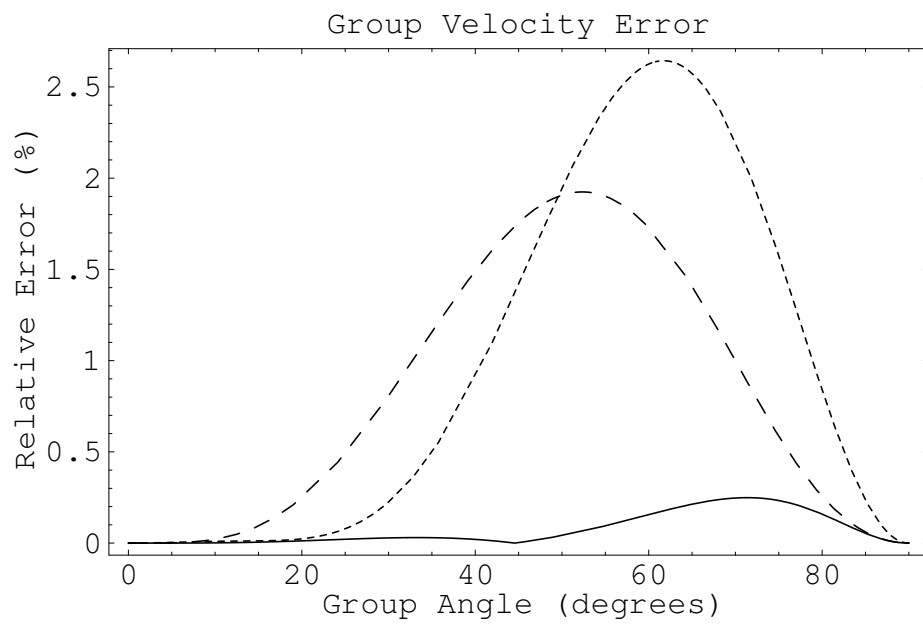


Figure 3: Third caption

LIST OF TABLES

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---	-------------------------	----

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

Table 1: Table caption