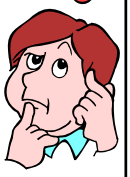
LaTeX

in scientific writing and publishing

LaTeX ?



Why do I need LaTeX?

What is LaTeX?

Where can I get LaTeX?

How can I use LaTeX?

Who can help me with LaTeX?

scientific publishing

History of scientific publishing

Long, long, long, long, long time ago

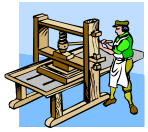
Not so long time ago

Now

scientific publishing

Major issues

Styles (quality and fast publishing technology)
Mathematical formulas
Tables
Graphics
Cross-references
Bibliography
Many revisions
…



example: Phys. Rev. style

scientific publishing

PHYSICAL REVIEW A 67, 042701 (2003)

Time evolution and use of multiple times in the *N*-body problem

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Under certain conditions it is possible to describe time evolution using different times for different particles. Use of multiple times is optional in the independent particle approximation, where interparticle interactions are removed, and the *N*-particle evolution operator factors into *N* single-particle evolution operators. In this limit one may use either a single time, with a single energy-time Fourier transform, or *N* different times with a different energy-time transform for each particle. The use of different times for different particles is fully justified when coherence between single-particle amplitudes is lost, e.g., if relatively strong randomly fluctuating residual fields influence each particle independently. However, when spatial correlation is present the use of multiple times is not feasible, even when the evolution of the particles is uncorrelated in time. Some calculations in simple atomic systems with and without spatial and temporal correlation between different electrons are included.

DOI: 10.1103/PhysRevA.67.042701 PACS number(s): 03.65.Nk, 03.65.Yz, 03.67.Hk, 42.50.−p

I. INTRODUCTION

A single time is, in principle, appropriate for all particles in any *N*-body system, no matter how complex the system. In practice, however, large systems are often approximately treated as a collection of uncorrelated or weakly connected subsystems. In such cases it is easier, and often sensible, to use *N* independent times for the independent subsystems, rather than to use a single time. In this paper we discuss conditions under which it is appropriate to use multiple times correlations. Examples are discussed where the use of multiple times is optional, where use of multiple times is fully justified, and finally where such use is not appropriate. We also present some calculations with and without spatial and temporal correlation.

II. THEORY

A. Formulation

Consider a system of *N* particles coupled to an external

Bibliography: cross-reference

scientific publishing

Multiple-differential cross sections of fragmentation processes in atomic collisions provide valuable information on the nature of electron correlation in atomic systems [1,2]. However, the double-electron transitions induced by collisions with photons and particles are extremely sensitive to both static and dynamic electron correlation [3]. Therefore, coincidence studies of double-electron transitions with fragmentation are among the most advanced methods for understanding how correlation works. Over the last decade there

[1] E. Weigold and I. E. McCarthy, *Electron Momentum Spectroscopy* (Plenum/Kluwer, New York, 1999).

[2] R. Moshammer, J. Ullrich, M. Unverzagt, W. Schmitt, P. Jardin, R. E. Olson, R. Mann, R. Dörner, V. Mergel, U. Buck, and H. Schmidt-Böcking, Phys. Rev. Lett. **73**, 3371 (1994).

[3] J. H. McGuire, *Electron Correlation Dynamics in Atomic Collisions* (Cambridge University Press, Cambridge, 1997).

[4] O. Schwarzkopf, B. Krässig, J. Elmiger, and V. Schmidt, Phys. Rev. Lett. **70**, 3008 (1993).

scientific publishing

example: equations and cross referencing

2.2. The second Born amplitude

The amplitude for the transfer-ionization in the second Born approximation may be written in the form similar to a singe capture transition, i.e.

$$f^{B2} = -(2\pi)^2 \sqrt{\mu_i \mu_f} < \Psi_f | V_f \hat{G}_0^+(E) V_i | \Psi_i >, \quad (14)$$

where V_i is the interaction potential in the incoming channel (5), V_f is the interaction potential in the outgoing channel,

$$V_f = -\frac{Z_t}{r_1} + \frac{1}{|\mathbf{r}_1 - \mathbf{r}_2|} - \frac{Z_p}{|\mathbf{r}_2 - \mathbf{R}|} + \frac{Z_p Z_t}{R}, \quad (15)$$

and $\hat{G}_0^+$ is a Green operator. The spectral form of the Green operator can be written as

$$\hat{G}_0^+(E) = \lim_{\varepsilon \to 0} \sum_n \int d\mathbf{K}_n \frac{|\Phi_n >< \Phi_n|}{E - E_n - K_n^2/2\mu_i + i\varepsilon} \frac{\exp[i\mathbf{K}_n(\mathbf{R} - \mathbf{R}')]}{(2\pi)^3}. \quad (16)$$

scientific publishing

example: tables

Table 1. Coefficients b in the velocity dependence $\sigma \propto v^{-b}$ for cross sections of transfer ionization for H^++He collisions.

experiment		theory		
Mergel (1997)	Schmidt (2005)	Born 1	Born 2 on	Born 2
10.02	10.81	11.23	11.31	10.76

scientific publishing

example: figures

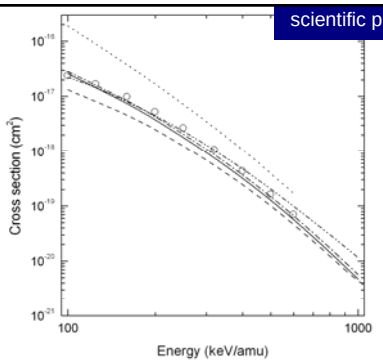


Figure 2. Transfer ionization cross sections for He^{2+} + He collisions. Present theoretical results: - - - -, first Born calculations; — · —, Born 2 on-shell; ——, Born 2 includes both on and off shell terms. Experiment: O , Shah and Gilbody (1985). Other calculations: ·····, Dunseath and Crothers (1991); — · · —, Belkic *et al* (1997).

scientific publishing

Microsoft Office and LaTeX

	MS Word	LaTeX
Styles	yes	yes
Bibliography cross-references	no*	yes
Mathematical formulas	yes**	yes
Formulas: cross-references	yes***	yes
Tables	yes	yes
Include graphics	yes	yes

* unless you use EndNote software
** MS equation editor has limited number of symbols and templates
***Cross-reference in Word is possible but the way is tedious

scientific publishing

LaTeX

LaTeX has clear advantage when

- You need a professionally looking text
- you write a paper, report or thesis that has more than few equations and cross-references
- You plan to edit/revise text in a way that would change number of equations, references, tables, figures, etc.

scientific publishing

LaTeX

- LaTeX has a very steep learning curve
- In Latex content and style are separated
- In LaTeX you may change style instantly
- LaTeX has good portability (ASCII text)
- LaTeX has a good control*
- There is a zoo of software developed for LaTeX
- De facto standard for scientific publishing

* MS Word offers a control trough format styles and templates

WYSIWYG vs. Markup language

Microsoft Office

MS Word is a WYSIWYG system
what you see is what you get

$LaTeX$ is essentially a Markup Language (like HTML)

Example: an equation in LaTeX and Word

LaTeX markup text in an editor

```
\begin{equation}
\label{tFBA}
f^{B1} = -(2\pi )^2\,\sqrt{\mu _{\rm i} \mu _{\rm f}}\,
<\Psi _{\rm f}|\,V_{\rm i}\,|\,\Psi _{\rm i}>,
\end{equation}
```

LaTeX text after processing

$$f^{B1} = -(2\pi)^2 \sqrt{\mu_i \mu_f} < \Psi_f | V_i | \Psi_i >,$$

Form MS Word →

$$f^{B1} = -(2\pi)^2 \sqrt{\mu_i \mu_f} \langle \Psi_f | V_i | \Psi_f \rangle$$

one more example:

LaTeX text in an editor

```
and $\hat G^{+}_0$ is a Green operator.
The spectral form of the Green operator can be written as
\begin{equation}
\label{Green}
\hat G^{+}_0(E) \,=\, \lim_{\varepsilon \to 0} \sum_{n}
\int \rm d{\bf K}_\alpha \frac{|\Phi _{\rm n} ><\Phi _{\rm n}|}
{E-E_{\rm n} - K^2_\alpha /2\mu _{\rm i} +\rm i\varepsilon }\,
\frac{\exp[\rm i {\bf K}_\alpha ({\bf R}-{\bf R}')]}{(2\pi )^3}.
\end{equation}
```

LaTeX text after processing

and $\hat{G}_0^+$ is a Green operator. The spectral form of the Green operator can be written as

$$\hat{G}_0^+(E) = \lim_{\varepsilon \to 0} \sum_n \int d\mathbf{K}_\alpha \frac{|\Phi_n><\Phi_n|}{E - E_n - K_\alpha^2/2\mu_i + i\varepsilon} \frac{\exp[i\mathbf{K}_\alpha(\mathbf{R} - \mathbf{R}')]}{(2\pi)^3}. \quad (16)$$

TeX

TeX was written by Donald Knuth in 70´s

$LaTeX$

Latex is an extension of TeX (Macro packages to make TeX easier to use). LaTeX was originally written in 1984 by Leslie Lamport at SRI International and has become the dominant method for using TeX.

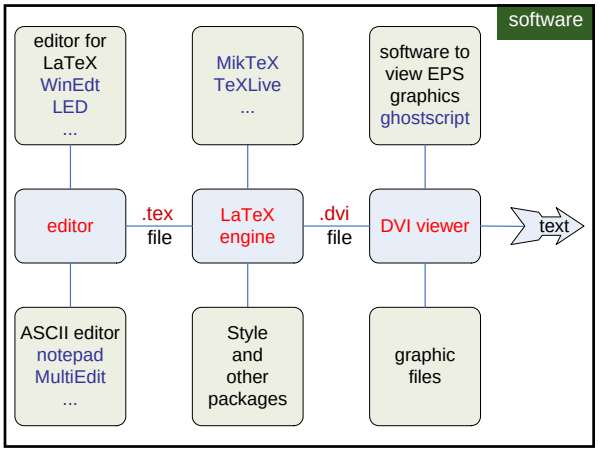
Beware if you really want to try …

- unlike MS Word LaTeX installation normally needs to install more than one program
- you are supposed to know about style files and packages
- you are supposed to have, at least minimum, knowledge about LaTeX commands
- you are supposed to know how to include graphics
- … and more
- … and more and more

Do you really want to try???

$LaTeX$

software



software

LaTeX systems (all in one)

Scientific Word	$$$	
Scientific WorkPlace	$$$	
PCTeX		
Writer	$	
Publisher	$$	
VTeX	$$ - $$$	(last version 2005)
TrueTeX	$$$	(last version 2007)

software

LaTeX engines (most popular)

MiKTeX (free)

TeXLive (free)

MacTeX (free?)

software

Add-ons

converts Microsoft Word documents to LaTeX format ($$)

is a converter used with Microsoft Word which enables it to open documents in TeX format ($$)

is an equation editor that lets you create and edit math equations, and then copy them into LaTeX and TeX documents.

MathType may also be used with Microsoft Word ($)

Practical moment – Installing LaTeX (one of possible free configurations)

Step 1: Download and install

http://www.miktex.org/

present version is 2.7

(April 2009)

Recommended configuration: "Basic MiKTeX" (about 85 MB) (full version is >250 MB)

software

IDE* LaTeX editors

* IDE (Integrated Development Environment) [edit, compile, view, print] you may use any ASCII editor but then you should know LaTeX mark up commands (hundreds of commands!)

Kile (Linux only)

Mac (only)

LYX

TeXmaker

Practical moment – Installing LaTeX (one of possible free configurations)

Step 2: Download and install one of editors

TeXmaker: http://www.xm1math.net/texmaker/
present version 1.8 (free)

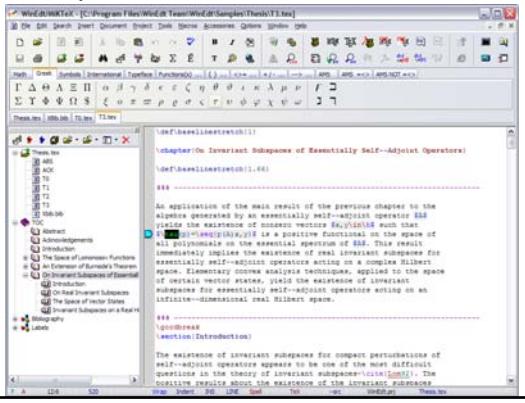
LaTeX editor http://www.latexeditor.org/
present version is 0.52 beta (about 5.0 MB)

Kile: http://kile.sourceforge.net/
very good but works with Linux only
Kile is a part of andLinux (Ubuntu Linux running on Windows XP, Vista (32-bit only)

WinEdt: http://www.winedt.com/
stable version 5.5 (about 9.0 MB), there is a 31 day free trial period, license: educational $40, student $30

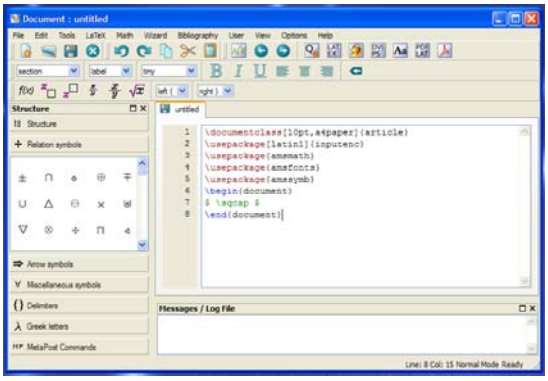
software

Example: WinEdt



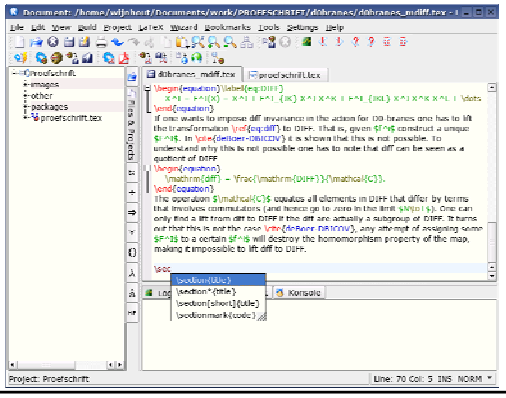
software

Example: TexMaker



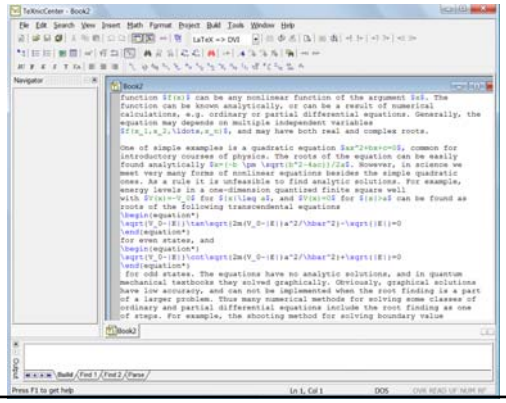
software

Example: Kile



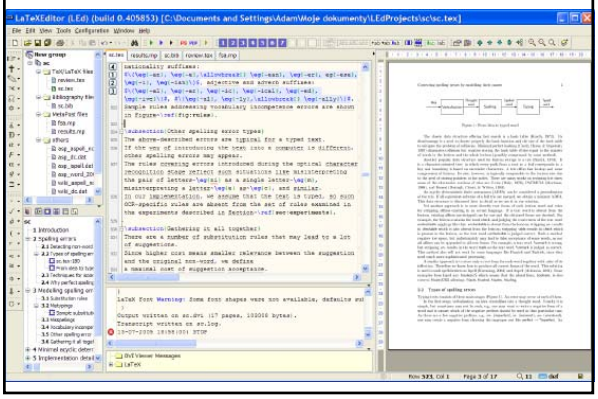
software

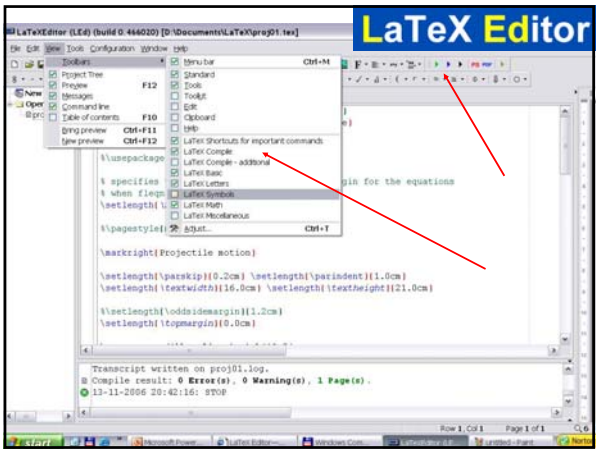
Example: TeXnicCenter

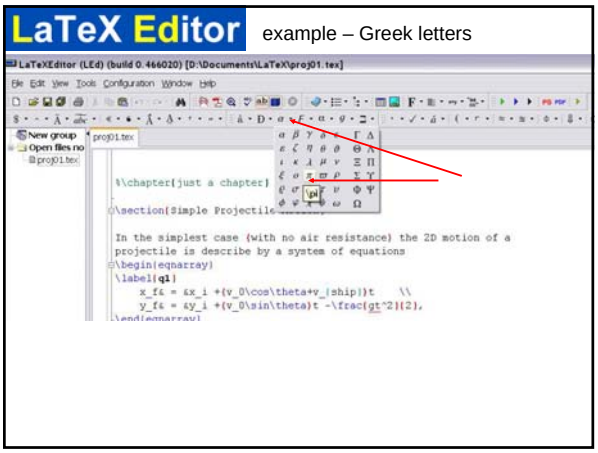


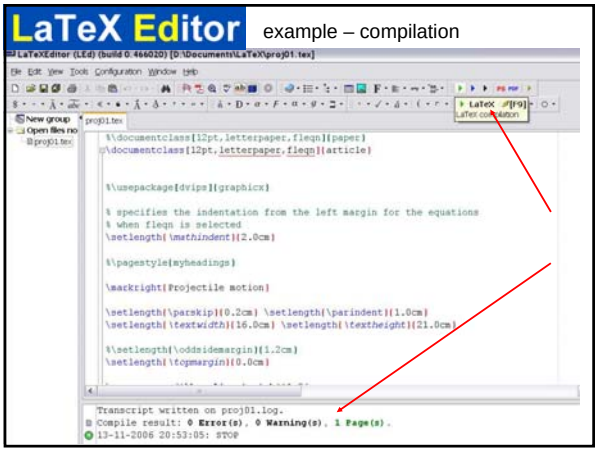
Example LEd

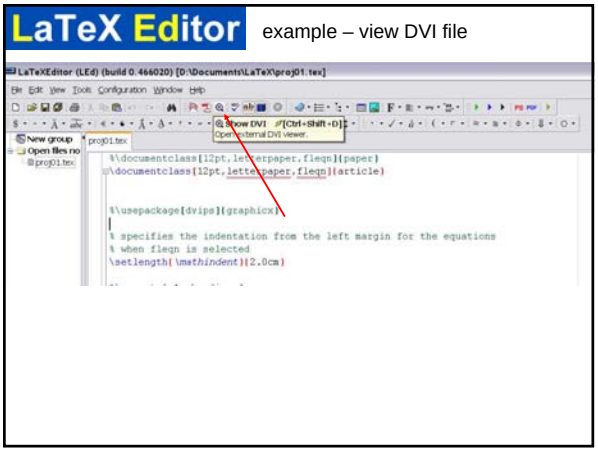
LaTeX Editor

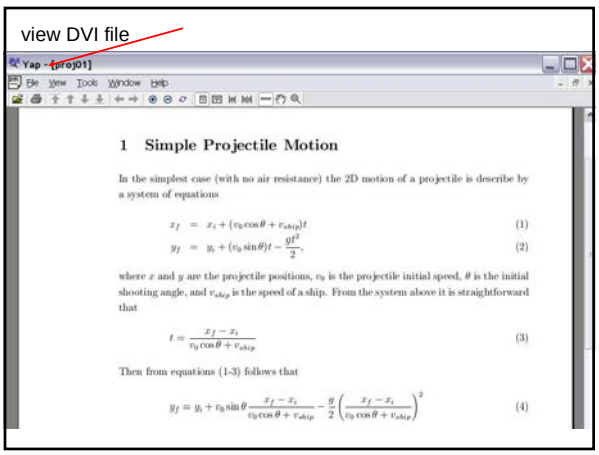


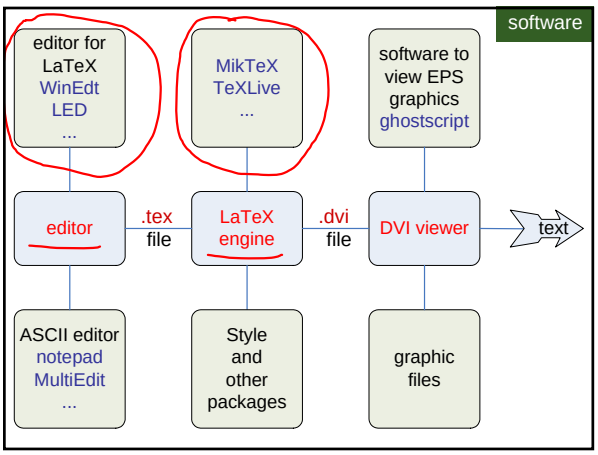

LaTeX Editor


LaTeX Editor
example – Greek letters


LaTeX Editor
example – compilation


LaTeX Editor
example – view DVI file


view DVI file
1 Simple Projectile Motion


software
editor for LaTeX
WinEdt
LED
...
MikTeX
TeXLive
...
software to view EPS graphics
ghostscript
editor
.tex file
LaTeX engine
.dvi file
DVI viewer
text
ASCII editor
notepad
MultiEdit
...
Style and other packages
graphic files

LaTeX

first steps in mastering LaTeX

LaTeX commands
understanding document organization
text
mathematical formulas
cross-references
bibliography
tables and graphs
…

LaTeX is a mark up language

A LaTeX document consists of one or more source files containing plain text characters, the actual textual content plus markup commands.

A command is an instruction to LaTeX to do something special

There are three types of commands:

- the single characters: # $ & ~ _ ^ % { } all have special meaning
- the backslash character \ plus a sequence of letters
  e.g. \begin{equation}.
  Command names are case sensitive
- the backslash character \ plus a single non-letter character (e.g. \$ means to print $)

Two types of markup commands

Typographical markup

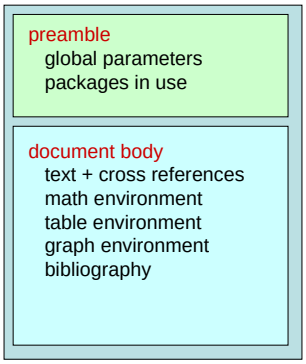
We {\bf learn} LaTeX = We **learn** LaTeX

Logical markup

\title{Computational Physics}
\section{Projectile motion}

layout

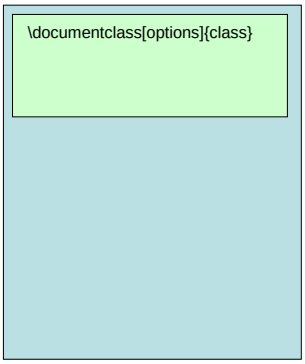
Document Layout and Organization



Every LaTeX file contains a *preamble* and a *body*

layout

Preamble



The preamble is a collection of commands that specify the global processing parameters (style of document, paper format, page numbering, etc.)

If there are no other commends but \documentclass[options]{class}, then LaTeX selects standard values (for margins, page size, etc.)

layout

Preamble: example

```
\documentclass[12pt,letterpaper,fleqn]{article}
\usepackage[dvips]{graphicx}
\setlength{\mathindent}{2.0cm}
\pagestyle{myheadings}
\markright{Projectile motion}
\setlength{\parskip}{0.2cm}
\setlength{\parindent}{1.0cm}
\setlength{\textwidth}{16.0cm}
\setlength{\textheight}{21.0cm}
\setlength{\oddsidemargin}{1.2cm}
\setlength{\topmargin}{0.0cm}
\renewcommand{\baselinestretch}{1.2}
\title{Project 1: Simple Projectile Motion}
\author{Alex}
```

layout

Preamble: Phys. Rev.

```
%   Version 4.0 of REVTeX, August 2001
%   Copyright (c) 2001 The American Physical Society.
%   See the REVTeX 4 README file for more information.
\documentclass[twocolumn,showpacs,preprintnumbers,am
      smath,amssymb]{revtex4}
% Some other (several out of many) possibilities
%\documentclass[preprint,aps]{revtex4}
%\documentclass[preprint,aps,draft]{revtex4}
%\documentclass[prb]{revtex4}% Physical Review B
\usepackage{graphicx}% Include figure files
\usepackage{dcolumn}% Align table columns on decimal
      point
\usepackage{bm}% bold math
```

layout

Document Body

```
%The document body is between
\begin{document}
     some text
\end{document}
```

layout

Document body

```
\begin{document}
…
We note t
ionization
amplitude
$\Phi_{i}(\
first' case
angle, $\O
the ionize
\begin{eq
\label{sig
\frac{d^3\
= 2 \frac{K
\end{equa
here $k_e
thus depe
…
\end{docu
```

We note that in the transfer first amplitude f_{tr}, the transfer and ionization process are separable, this is not the case for the ionization first amplitude f_{ion}. Consequently the dependence on the initial state $\Phi_i(\vec{r}_1, \vec{r}_2)$ is much more transparent in the 'transfer first' case. The triple differential cross section as a function of the scattered angle, Ω_f, and the energy E_e and the angle Ω_e of the ionized electron is the coherent sum of both amplitudes i.e.

$$\frac{d^3\sigma}{dE_e d\Omega_e d\Omega_f} = 2\frac{K_f k_e}{K_i}|f_{tr} + f_{ion}|^2, \qquad (4)$$

here k_e is the momentum of the ejected electron. The cross section thus depends on both mechanisms and their interference.

layout

A minimal LaTeX file

```
\documentclass{article}
```

```
\begin{document}
some text
\end{document}
```

layout

classic example

```
\documentclass[12pt]{article}
\title{\LaTeX}
\date{}
```

```
\begin{document}
\maketitle \LaTeX{} is a document preparation system for the \TeX{}
typesetting program. It offers programmable desktop publishing features and
extensive facilities for automating most aspects of typesetting and desktop
publishing, including numbering and cross-referencing, tables and figures,
page layout, bibliographies, and much more. \LaTeX{} was originally written in
1984 by Leslie Lamport and has become the dominant method for using \TeX;
few people write in plain \TeX{} anymore. The current version is \LaTeXe.
\newline
% This is a comment, it is not shown in the final output.
\begin{eqnarray}
   E &=& mc^2                          \\
   m &=& \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}
\end{eqnarray}
\end{document}
```

classic example

layout

LaTeX

LaTeX is a document preparation system for the TeX typesetting program. It offers programmable desktop publishing features and extensive facilities for automating most aspects of typesetting and desktop publishing, including numbering and cross-referencing, tables and figures, page layout, bibliographies, and much more. LaTeX was originally written in 1984 by Leslie Lamport and has become the dominant method for using TeX; few people write in plain TeX anymore. The current version is LaTeX 2ε.

$$E = mc^2 \quad (1)$$

$$m = \frac{m_0}{\sqrt{1-\frac{v^2}{c^2}}} \quad (2)$$

Document class

layout

The first command in every laTeX document
\documentclass[options]{class}
The standard values of class: article, report, book, letter.
For Phys. Rev. - revtex4: take from http://authors.aps.org/revtex4/
for IOP journals – iopart: take from http://www.iop.org/)

Standard class options

font size:	10pt	11pt	12pt
papersize:	lettersize		a4paper
page formats:	onecolumn		twocolumn

… and many other options

example:
\documentclass[12pt,lettersize]{article}

Title page

layout

A title page can be produced in a preprogrammed LaTeX style
\title{title text}
\author{name(s)}
\date

abstract:
\begin{abstract}
text for abstract
\end{abstract}

\maketitle

comment: many journals have their title page commands

Title page (example for IOP journals)

layout

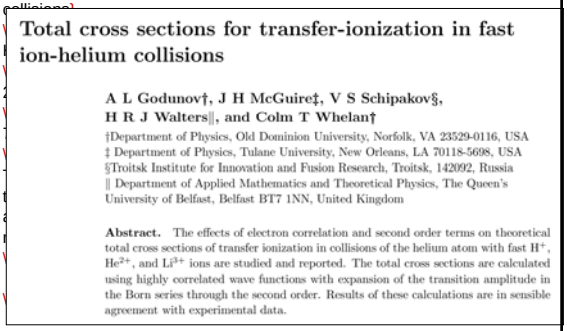
\title{Total cross sections for transfer-ionization in fast ion-helium collisions}
\author{A~L~Godunov^1, J~H~McGuire^2,V~S~Schipakov^3, H~R~J~Walters^4, and Colm~T~Whelan^1}
\address{^{1} Department of Physics, Old Dominion University, Norfolk, VA 23529-0116, USA}
\address{^{2} Department of Physics, Tulane University, New Orleans, LA 70118-5698, USA}
\begin{abstract}
The effects of electron correlation and second order terms on theoretical total cross sections of transfer ionization in collisions of the helium atom with fast H$^+$, He^{2+}, and Li^{3+} ions are studied and reported. ….
\end{abstract}

\maketitle

Title page (example for IOP journals)

layout

\title{Total cross sections for transfer-ionization in fast ion-helium collisions}



Total cross sections for transfer-ionization in fast ion-helium collisions

A L Godunov†, J H McGuire‡, V S Schipakov§, H R J Walters‖, and Colm T Whelan†

†Department of Physics, Old Dominion University, Norfolk, VA 23529-0116, USA
‡ Department of Physics, Tulane University, New Orleans, LA 70118-5698, USA
§Troitsk Institute for Innovation and Fusion Research, Troitsk, 142092, Russia
‖ Department of Applied Mathematics and Theoretical Physics, The Queen's University of Belfast, Belfast BT7 1NN, United Kingdom

Abstract. The effects of electron correlation and second order terms on theoretical total cross sections of transfer ionization in collisions of the helium atom with fast H^+, He^{2+}, and Li^{3+} ions are studied and reported. The total cross sections are calculated using highly correlated wave functions with expansion of the transition amplitude in the Born series through the second order. Results of these calculations are in sensible agreement with experimental data.

Text

how to

New paragraph is indicated in the text by an empty line
There are variety of commands to change font size, centering, indentation, making lists, and so on.
Example for centering:

```
\begin{center}
some text
\end center
```

example for a numbered list

```
\begin{enumerate}
\item some text
\item some text
\end{enumerate}
```

for unnumbered list:

```
\begin{itemize} …. \end{itemize}
```

how to

Chapters, sections, etc.

Example

\section {Theoretical model for the transfer-ionization}
\subsection {The first Born amplitude}
We consider a structureless projectile incident upon a two electron target

2. Theoretical model for the transfer-ionization

2.1. The first Born amplitude

We consider a structureless projectile incident upon a two electron target

how to

Mathematical Formulas

There are very many commands to type mathematical formulas

LaTeX must be informed where the math text starts and where ends. Math commands can not be placed outside math environment!!!

The processing of math text is carried out by switching to math mode.

Mode 1: a line in a text between $ $

Mode 2: a displayed equation

```
\begin{equation}
\label{somelabel}
c=a + b
\end{equation}
```

how to

Mathematical Formulas

math elements – hundreds commands in LaTeX:

- constants and variables
- exponents and indices
- fractions
- roots
- sums and integrals
- Greek letters
- binary operations
- relations
- arrows and pointers
- function names
- mathematical accents
- matrices and arrays
- multiline equations

how to

example: Greek letters

lowercase letters

α	\alpha	θ	\theta	o	o	τ	\tau
β	\beta	ϑ	\vartheta	π	\pi	υ	\upsilon
γ	\gamma	ι	\iota	ϖ	\varpi	ϕ	\phi
δ	\delta	κ	\kappa	ρ	\rho	φ	\varphi
ϵ	\epsilon	λ	\lambda	ϱ	\varrho	χ	\chi
ε	\varepsilon	μ	\mu	σ	\sigma	ψ	\psi
ζ	\zeta	ν	\nu	ς	\varsigma	ω	\omega
η	\eta	ξ	\xi				

Uppercase letters

Γ	\Gamma	Λ	\Lambda	Σ	\Sigma	Ψ	\Psi
Δ	\Delta	Ξ	\Xi	Υ	\Upsilon	Ω	\Omega
Θ	\Theta	Π	\Pi	Φ	\Phi		

how to

example: binary operations

$\pm$	\pm	$\cap$	\cap	$\circ$	\circ	$\bigcirc$	\bigcirc
$\mp$	\mp	$\cup$	\cup	$\bullet$	\bullet	$\Box$	\Box
$\times$	\times	$\uplus$	\uplus	$\diamond$	\diamond	$\Diamond$	\Diamond
$\div$	\div	$\sqcap$	\sqcap	$\lhd$	\lhd	$\bigtriangleup$	\bigtriangleup
$\cdot$	\cdot	$\sqcup$	\sqcup	$\rhd$	\rhd	$\bigtriangledown$	\bigtriangledown
$\ast$	\ast	$\vee$	\vee	$\unlhd$	\unlhd	$\triangleleft$	\triangleleft
$\star$	\star	$\wedge$	\wedge	$\unrhd$	\unrhd	$\triangleright$	\triangleright
$\dagger$	\dagger	$\oplus$	\oplus	$\oslash$	\oslash	$\setminus$	\setminus
$\ddagger$	\ddagger	$\ominus$	\ominus	$\odot$	\odot	$\wr$	\wr
$\amalg$	\amalg	$\otimes$	\otimes				

how to

Mathematical Formulas (examples)

Mode 1

state $\Phi _{i}({\bf r}_{1},{\bf r}_{2})$ → $\text{state } \Phi_i(\mathbf{r}_1, \mathbf{r}_2)$

Mode 2

```
\begin{equation}
\label{total}
\sigma = 2 \frac{K_{\rm f}}{K_{\rm i}} \, \int |f^{\rm B1}+f^{\rm B2}|^2 \,k_{\rm e} {\rm d E_{\rm e} \rm d \Omega _{\rm e} \rm d \Omega _{\rm f}},
\end{equation}
```

$$\sigma = 2\frac{K_\mathrm{f}}{K_\mathrm{i}} \int |f^{\mathrm{B1}} + f^{\mathrm{B2}}|^2 \, k_\mathrm{e} \mathrm{dE_e d\Omega_e d\Omega_f},$$

how to

Mathematical Formulas (one more example)

```
\begin{equation}
\label{Sokhotsky}
\lim_{\varepsilon \to \pm 0} \int \frac{f(x)}{x-x_0 \pm \varepsilon}dx
\, = \,
{\rm P}\int \frac{f(x)}{x-x_0}dx \, \pm \, i \pi f(x_0),
\end{equation}
```

$$\lim_{\varepsilon \to \pm 0} \int \frac{f(x)}{x - x_0 \pm \varepsilon} dx \, = \, \mathrm{P} \int \frac{f(x)}{x - x_0} dx \, \pm \, i\pi f(x_0),$$

how to

Cross-references

a command

\label{*somemarker*} is used to store the current value of a relevant counter (section, equation, etc.) at that point in the text, which then may be referred to at other places.

```
The second term in equation (\ref{Sokhotsky}) is usually
```

The second term in equation (26) is usually

Each label is associated with its environment (equation, table, figure), i.e. a number corresponding to a label in an equation do not interfere with numbers for tables

how to

Bibliography

```
Citation in the text \cite{marker1}
```

the actual bibliography is placed inside the environment (at the end of a document)

```
\begin{thebibliography}{99}
  \bibitem{marker1} some entry text
\end{thebibliography}
```

after processing:

Citation in the text [1] …

how to

Tables (example)

```
\begin{table}
\caption{Coefficients b in the velocity dependence $\sigma \propto v^{-b}$ for
  cross sections of transfer ionization for H$^+$+He collisions.}
\begin{indented}
\item [ ]\begin{tabular}{@{}ccccc}
\br
\multicolumn{2}{c}{experiment} &  \multicolumn{3}{c}{theory}  \\
%\mr
 Mergel (1997)  & Schmidt (2005) &
   Born 1  &  Born 2 on   & Born 2     \\
\mr
  10.02  & 10.81    &  11.23   &  11.31      &  10.76  \\
\br
\end{tabular}
\end{indented}
\end{table}
```

how to

Tables

Result after processing

Table 1. Coefficients b in the velocity dependence $\sigma \propto v^{-b}$ for cross sections of transfer ionization for H^++He collisions.

experiment		theory		
Mergel (1997)	Schmidt (2005)	Born 1	Born 2 on	Born 2
10.02	10.81	11.23	11.31	10.76

how to

Figures

```
\begin{figure}[t]
\label{fig2}
\centering
\includegraphics[width=12.0cm]{figure2.eps}
\caption{Transfer ionization cross sections for He$^{2+}$ + He collisions.
Present theoretical results: \dashed, first Born calculations; \chain, Born 2
on-shell; \full, Born 2 includes both on and off shell terms. Experiment:
\opencircle, Shah and Gilbody (1985). Other calculations: \dotted,
Dunseath and Crothers (1991); \dashddot, Belkic \etal (1997).
}
\end{figure}
```

how to

Figures

Result after processing

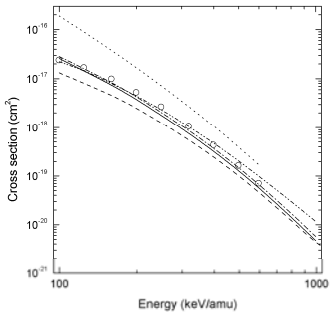
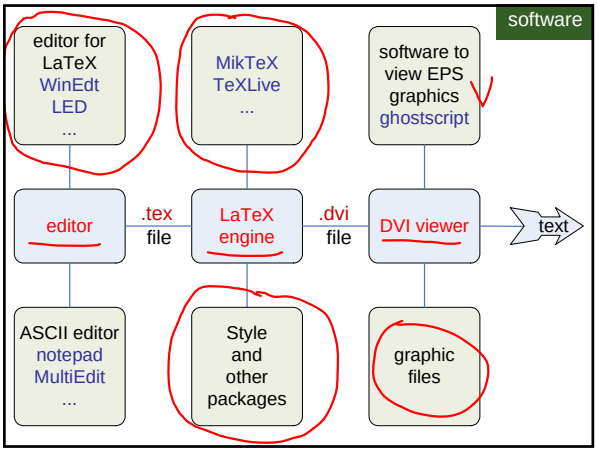


Figure 2. Transfer ionization cross sections for He^{2+} + He collisions. Present theoretical results: - - - -, first Born calculations; — · —, Born 2 on-shell; ——, Born 2 includes both on and off shell terms. Experiment: ○, Shah and Gilbody (1985). Other calculations: ·····, Dunseath and Crothers (1991); — · · —, Belkic *et al* (1997).

software



reference information

Web

Comprehensive TeX Archive Network
http://www.ctan.org/

LaTeX – A document preparation system
http://www.latex-project.org/

TeX Users Group web site
http://www.tug.org/

TeX Resources Home Page from AMS
http://www.ams.org/tex/

reference information

Web (more specific)

Ask Google!!!

Hypertext Help with LaTeX from NASA
http://www.giss.nasa.gov/tools/latex/

LaTeX resources: A collection of tutorials and other resources from the University of Cambridge
http://www-h.eng.cam.ac.uk/help/tpl/textprocessing/

LATEX for Complete Novices:
http://theoval.sys.uea.ac.uk/~nlct/latex/novices/novices.html

LaTeX Tutorials: a Primer:
http://www-h.eng.cam.ac.uk/help/tpl/textprocessing/ltxprimer-1.0.pdf

Getting to grips with Latex:
http://www.andy-roberts.net/misc/latex/index.html

reference information

Books

Guide to LaTeX by H. Kopka and P.W. Daly, 4th edition (2003)

LaTeX: A document preparation system, User's guide and reference manual by Leslie Lamport, 2nd edition, (1994)

The LaTeX Companion, by F. Mittelbach, et al 2nd edition (2004)

The LaTeX Graphics Companion,Illustrating Documents with TeX and PostScript by M. Goossens, S. Rahtz, F. Mittelbach (1997)

The LaTeX Web Companion, Integrating TeX, HTML and XML by M. Goossens and S. Rahtz (1999)

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