



The LiteSolution Class

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An Introduction to The **LiteSolution** Class

1 Introduction

This is the document for the **litesolution** class, which provides a lite design for typesetting solutions of exams, textbooks or other exercises.

Welcome to feedback bugs or ideas via email xiamyphys@gmail.com or GitHub.

1.1 Installing **litesolution** and loading it

Simply download `litesolution.cls` file from GitHub or CTAN and save it under your working directory. However, I strongly suggest to use terminal to install and update all packages to the latest version

```
sudo tlmgr update --self --all
```

To learn more, please refer to [How do I update my TeX distribution?](#)

1.2 Compatibility

The test environments are macOS + MacTeX 2024 / Overleaf / Ubuntu 22.04.2 + TeX Live 2024 and they all work fine for pdfLaTeX and XeLaTeX compilers. Windows and Unix platforms compatibility unknown.

2 Global Options of this Class

```
\documentclass[<options>]{litesolution}
```

2.1 The **answer** option

The **ans** and **noans** modes can show or hide contents in **solution** environment and **ans** command.

2.2 The **counter** option

The **separate** and **continuous** modes can make the page number between chapters be reset or continuous.

2.3 The **math** option

The **mtpro2** and **newtx** modes can format the font of formulas in the document. Please check if **mtpro2** font has been installed on your computer correctly before using **mtpro2** mode.

3 Cover Configurations

3.1 The cover page configurations

```

\title{<content>}                \subtitle{<content>}
\bioinfo{<content>}              \cover[<pattern>]{<image>}
\coverhead[<angle>]{<image>}    \coverhead*[<angle>]{<content>}

\begin{document}                 \maketitle[<color>]

\title{\sffamily The \pkg{litesolution} Class}
\subtitle{\sffamily\scshape Hangzhou Dianzi University}
\bioinfo{\scshape\sffamily Mingyu Hsia, \href{mailto:xiamyphys@gmail.com}
        {\ttfamily xiamyphys@gmail.com} | \today, Version 2.1a}
\cover[checkerboard]{schrodinger} \coverhead[5]{universe}

\begin{document}                 \maketitle[Midnightblue]

```

3.2 The chapter head configurations

```
\chapterimage {<insert image macro>}
```

This command can assign the format of the image at every chapters begin and you can adjust the format of the image with the `fadingimage` package.

4 Preset Commands

4.1 The `ans` command

```
\ans {<contents>}
```

This command can underline the answer, and if mode `noans` is enabled, the answer will be hidden.

4.2 The `solute` command

```
\solute {<number>}                \solute* {<contents>}
```

This command can create a fixable answer box when the mode `noans` is enabled.

4.3 Other preset commands

```

\def\i{\mathrm i}                \def\e{\mathrm e}                \def\T{\mathsf T}
\let\leq\leqslant                \let\geq\geqslant

```

5 Preset **amsthm** Environments

5.1 The **problem** environment

```
\begin{problem}\leavevmode
\begin{tasks}(2)
  \task Choice A \task[\true] Choice B
  \task Choice C \task Choice D
\end{tasks}
\end{problem}
```

❑ **PROBLEM 1.**

- A. Choice A Choice B
 C. Choice C D. Choice D

5.2 The **solution** and **note** environment

```
\begin{solution}
  B is correct.
\end{solution}
```

❑ **SOLUTION.** B is correct.

```
\begin{note}
  We note that.
\end{note}
```

❗ **NOTE.** We note that.

5.3 Equation test

$$i\hbar \partial_t \psi(\mathbf{x}, t) = -(i\hbar c \boldsymbol{\alpha} \cdot \nabla + \beta mc^2) \psi(\mathbf{x}, t)$$

6 Preset packages

This template has preset many packages. The following packages are the common ones

amsthm	bm	booktabs	cancel	caption	circuitikz	datetime	derivative
diagbox	esvect	extrarrows	fancyhdr	fixdif	fontawesome5	geometry	indentfirst
lipsum	multicol	multirow	nicematrix	paracol	pgfplots	physics2	refstyle
setspace	siunitx	tabularx	tasks	wallpaper	xcolor	xeCJK	xfrac

7 Related packages

7.1 The **notebeamer** package

This package provides an easy way to input slides on note papers quickly for making annotations.

7.2 The **fadingimage** package

This package provides three commands for adding fading full width picture at the top or bottom of a page.

Appendix Original code for the cover head

```

\documentclass[svgnames,tikz]{standalone}

\usepackage{xcolor}\let\Bbbk\relax
\usepackage{newtxtext,mtpro2,cancel,physics2,xfrac}
\usephysicsmodule{ab.legacy}
\usetikzlibrary{tikzmark}
\tikzset{every node/.style={align=center,MidnightBlue!30},
every path/.style={MidnightBlue!30,line cap=round}}

\begin{document}\tikz{
  \node [above right] at (0,0) {$\color{MidnightBlue!30}
  \tikzmarknode a{\Psi}=\displaystyle\tikzmarknode b{\int}
  \tikzmarknode c{\mathrm e}^{\frac{\tikzmarknode d{\mathrm i}}{\tikzmarknode e{\hbar}}
  \int\ab\frac{\tikzmarknode fR}{16\pi\tikzmarknode gG}-\frac{14\tikzmarknode hF^2}{\overline{\psi}\mathrm i\tikzmarknode{i}\cancel{D}\psi-\tikzmarknode j{\lambda}
  \tikzmarknode k{\varphi}\overline{\psi}}\psi
  +\abs{D\tikzmarknode l{\varphi}}^2-V(\varphi))}$};
  \draw ([yshift=-1ex] a.south) coordinate (A) ---+ (0,-.5)
  node [scale=.45,below] {Schr"odinger\\footnotesize wave function};
  \draw ([yshift=1ex] b.north) coordinate (B) ---+ (0,.55)
  node [scale=.45,above] {\footnotesize path integral\\Feynmann};
  \draw ([yshift=-1ex] c.south) coordinate (C) ---+ (0,-.7)
  node [scale=.45,below] {Euler\\footnotesize exponential};
  \draw ([yshift=1ex] d.north) coordinate (D) ---+ (0,.45)
  node [scale=.45,above,xshift=1ex] {\footnotesize imaginary unit};
  \draw ([yshift=-1ex] e.south) coordinate (E) ---+ (0,-.5)
  node [scale=.45,below,xshift=2ex] {Planck\\footnotesize quantum};
  \draw ([yshift=1ex] f.north) coordinate (F) ---+ (0,.7)
  node [scale=.45,above] {\footnotesize spacetime-relativity\\Einstein};
  \draw ([yshift=-1ex] g.south) coordinate (G) ---+ (0,-.5)
  node [scale=.45,below] {Newton\\footnotesize gravitation};
  \draw ([yshift=1ex] h.north) coordinate (H) ---+ (0,.5)
  node [scale=.45,above,xshift=5ex] {\footnotesize strong/weak/e.m. interactions\\
  Maxwell Yang-Mills};
  \draw ([yshift=-1ex] i.south) coordinate (I) ---+ (0,-.6)
  node [scale=.45,below] {Dirac\\footnotesize relativistic wave function};
  \draw ([yshift=-1ex] j.south) coordinate (J) ---+ (0,-.2)
  node [scale=.45,below,xshift=3ex] {Kobayashi-Maskawa\\footnotesize CKM matrix};
  \draw ([yshift=1ex] k.north) coordinate (K) ---+ (0,.5)
  node [scale=.45,above] {\footnotesize $\varphi$ - $\psi$ interaction\\Yukawa};
  \draw ([yshift=-1ex] l.south) coordinate (L) ---+ (0,-.3)
  node [scale=.45,below] {Higgs\\footnotesize Boson};
  \foreach \x in {A,B,...,L}\fill [MidnightBlue!30] (\x) circle (.025);}
\end{document}

```