

## Introduction & Usage

*This is an example of the effect of this template:*

0 某纯  $\beta$  放射性核素的测量结果如下表所示。请计算该核素的半衰期、衰变常数，并判断是那种核素。

时间 (天)	0	1	2	3	5	10	20
计数率 (cpm)	5500	5240	5000	4750	4320	3400	2050

放射性衰减规律为  $N = N_0 e^{-\lambda t}$ , 用该公式对表中的数据进行拟合。使用 MATLAB 代码如下:

```
1 ti=[0 1 2 3 5 10 20]';  
2 ni=[5500 5240 5000 4750 4320 3400 2050]';  
3 syms t;  
4 f=fittype('N*exp(-lambda*t)','independent','t','coefficients',{'N','lambda'});  
5 fun=fit(ti,ni,f);
```

上述代码给出的拟合结果为:

$$N_0 = 5507 \text{ (5484,5530) cpm}$$

$$\lambda = 0.0489 \text{ (0.04808,0.04972) d}^{-1}$$

其中括号表示 95% 的置信区间。

因此, 该核素的衰变常数为  $0.0489 \text{d}^{-1}$ , 根据半衰期与衰变常数的关系:

$$T_{1/2} = \frac{\ln 2}{\lambda} = 14.2 \text{d}$$

即该核素的半衰期为 14.2 天。查得此核素为  $^{32}_{15}\text{P}$ 。 ■

*Following is the introduction of some functions in this template:*

## Pictures, Tables, Codes, Math, Enumerate, Circuits

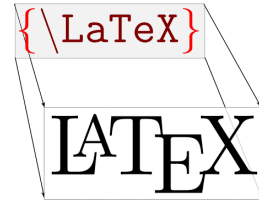
### 1 Insert Pictures

- (1) Single picture
- (2) Pictures in rows and columns
- (3) Wraaped picture

#### (1) Single picture

- Using center environment to insert an picture:

```
\begin{center}  
  \includegraphics[width=0.5\textwidth]{./pic/latex.png}  
\end{center}
```



- Using figure environment to insert an picture with description:

```
\begin{figure}[H]  
  \centering  
  \includegraphics[width=0.5\textwidth]{./pic/latex.png}  
  \caption{eg}  
\end{figure}
```

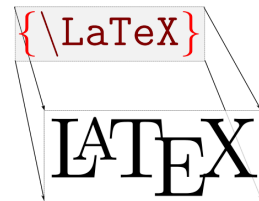


Figure 1: eg

#### (2) Pictures in rows and columns

- Multi-rows and multi-columns

```

\begin{figure}[H]
  \captionsetup{name={Fig.},font={small}}
  \centering
  \begin{minipage}[b]{0.3\textwidth}
    \centering
    \includegraphics[width=0.7\textwidth]{./pic/01.png}
    \caption{eg1}
  \end{minipage}
  \hspace{0.05\textwidth}
  \begin{minipage}[b]{0.3\textwidth}
    \centering
    \includegraphics[width=0.7\textwidth]{./pic/02.png}
    \caption{eg2}
  \end{minipage} \\\
  \begin{minipage}[b]{0.3\textwidth}
    \centering
    \includegraphics[width=0.7\textwidth]{./pic/03.png}
    \caption{eg3}
  \end{minipage}
  \hspace{-0.03\textwidth}
  \begin{minipage}[b]{0.3\textwidth}
    \centering
    \includegraphics[width=0.7\textwidth]{./pic/04.png}
    \caption{eg4}
  \end{minipage}
  \hspace{-0.03\textwidth}
  \begin{minipage}[b]{0.3\textwidth}
    \centering
    \includegraphics[width=0.7\textwidth]{./pic/05.png}
    \caption{eg5}
  \end{minipage}
\end{figure}

```



Fig. 2: eg1



Fig. 3: eg2



Fig. 4: eg3



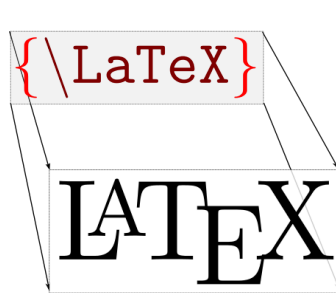
Fig. 5: eg4



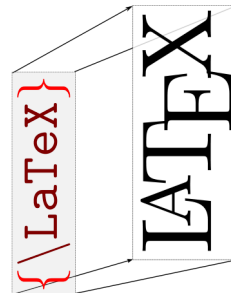
Fig. 6: eg5

- Subfigures in columns:

```
\begin{figure}[H]
  \centering
  \subfigure[first subfigure]{
    \begin{minipage}[b]{0.3\textwidth}
      \includegraphics[width=1\textwidth]{./pic/06.png} \\
      \vspace{0.3em}
      \includegraphics[width=1\textwidth]{./pic/latex.png}
    \end{minipage}
  }
  \hspace{2em}
  \subfigure[second subfigure]{
    \begin{minipage}[b]{0.3\textwidth}
      \centering
      \includegraphics[angle=90,width=1.0\textwidth]{./pic/06.↵
        png}\vspace{1em} \\
      \includegraphics[angle=90,width=0.7\textwidth]{./pic/↵
        latex.png}
    \end{minipage}
  }
  \caption{vertical subfigures}
\end{figure}
```



(a) first subfigure



(b) second subfigure

Figure 7: vertical subfigures

### (3) Wrapped picture

Insert a figure with texts around:

```

\begin{wrapfigure}{r}{0pt}
  \includegraphics[width=2.5cm]{./←
    pic/07.png}
\end{wrapfigure}
\renewcommand{\rubysize}{0.6}
\renewcommand{\rubysep}{0.2pt}
\textbf{Emoji} (Japanese: \ruby{絵←
  }{え}\ruby{文}{も}\ruby{字}{じ←
  }) are ideograms and smileys ←
  used in electronic messages and←
  web pages. Emoji exist in ←
  various genres, including ←
  facial expressions, common ←
  objects, places and types of ←
  weather, and animals. They are ←
  much like emoticons, but emoji ←
  are actual pictures instead of ←
  typographics.

```

**Emoji** (Japanese:

え も じ

絵文字) are ideograms and smileys used in electronic messages and web pages. Emoji exist in various genres, including facial



expressions, common objects, places and types of weather, and animals. They are much like emoticons, but emoji are actual pictures instead of typographics.

■

## 2 Insert Tables

- (1) A simple table
- (2) Three-line table
- (3) Table with slash header

### (1) A simple table

```

\begin{table}[H]
  \centering
  \caption{Radiation decrease}
  \label{rad}
  \begin{tabular}{|c|c|c|c|c|c|c|c|c|}
    \hline
    时间 (天) & 0 & 1 & 2 & 3 & 5 & 10 & 20 & \\
    \hline
    计数率 (cpm) & 5500 & 5240 & 5000 & 4750 & 4320 & 3400 & 2050 & ←
    \\
    \hline
  \end{tabular}
\end{table}

```

Table 1: Radiation decrease

时间 (天)	0	1	2	3	5	10	20
计数率 (cpm)	5500	5240	5000	4750	4320	3400	2050

### (2) Table with slash header

```

\begin{table}[H]
  \centering
  \begin{tabular}{c|cc}
    \hline
    \diagbox{$p$/\si{MPa}}{$t$/\si{\degreeCelsius}} & 300 & 350 \\
    \hline
    15.0 & 565.8 & \underline{112.8} \\
    17.5 & 570.5 & 452.5 \\
    20.0 & 575.5 & 465.0 \\
    \hline
  \end{tabular}
\end{table}

```

$p/\text{MPa}$ \ $t/^{\circ}\text{C}$	300	350
15.0	565.8	<u>112.8</u>
17.5	570.5	452.5
20.0	575.5	465.0

### (3) Three-line table

```

\begin{table}[H]
  \centering
  \begin{tabular}{ccc}
    \toprule
    温度$t$/\si{\degreeCelsius} & 压力$p$/\si{\mega\pascal} & 比焓$h$/(\si{kJ/kg}) \\
    \midrule
    340 & 14.608 & 1596 \\
    350 & 16.537 & 1672 \\
    \bottomrule
  \end{tabular}
\end{table}

```

温度 $t/^{\circ}\text{C}$	压力 $p/\text{MPa}$	比焓 $h/(\text{kJ/kg})$
340	14.608	1596
350	16.537	1672

■

## 3 Codes Display

- (1) Codes for different languages
- (2) L<sup>A</sup>T<sub>E</sub>X code and its output

### (1) Codes for different languages

Use *myminted* environment to display C++, MATLAB, Python, ... and many other kinds of languages. To find all the language supported, execute command “`pygmentize -L lexers`” in your terminal.

```

\begin{myminted}{c++}
#include <iostream>
using namespace std;

int main()
{
    cout<<"Hello, World!"<<endl;
    return 0;
}
\end{myminted}

```

```

1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     cout<<"Hello, World!"<<endl;
7     return 0;
8 }

```

## (2) $\text{\LaTeX}$ code and its output

There are two types: one is that display  $\text{\LaTeX}$  codes box on left side and output on right side, the other is that display output under  $\text{\LaTeX}$  codes box.

- **Left-code & right-output** — *latexample* environment

Use `\input{latexample.tex}` at the beginning of the tex file. Use as this:

```

\begin{latexample}
... LaTeX code here ...
\end{latexample}

```

Following is an example and the effect:

```

\begin{enumerate}[nosep,label=(\leftarrow
arabic*)]
\item first
\begin{itemize}
\item something
\item something else
\end{itemize}
\item second
\end{enumerate}

```

- (1) first
  - something
  - something else
- (2) second

- **Up-code & down-output** — *latexamplev* environment

Use `\input{latexamplev.tex}` at the beginning of the tex file. Use as this:

```

\begin{latexamplev}
... LaTeX code here ...
\end{latexamplev}

```

Following is an example and the effect:

```

\begin{enumerate}[nosep,label=(\arabic*)]
\item first
\begin{itemize}
\item something
\item something else
\end{itemize}
\item second
\end{enumerate}

```

- (1) first
  - something
  - something else
- (2) second

■

## 4 Math Input

This is a very huge question and I recommend to read a Chinese book [ChinaTeX Math FAQ](#) or an English book [More Math Into L<sup>A</sup>T<sub>E</sub>X](#).

■

## 5 Enumerate & Itemize

As shows the example of Problem 3, (2). Here package *enumitem* instead of package *enumerate* is used for enumerate and package *itemize* is used for itemize.

```
\begin{enumerate}[nosep,label=(\leftarrow
  arabic*)]
  \item first
    \begin{itemize}
      \item something
      \item something else
    \end{itemize}
  \item second
\end{enumerate}
```

- (1) first
  - something
  - something else
- (2) second

■

## 6 Plot Circuits

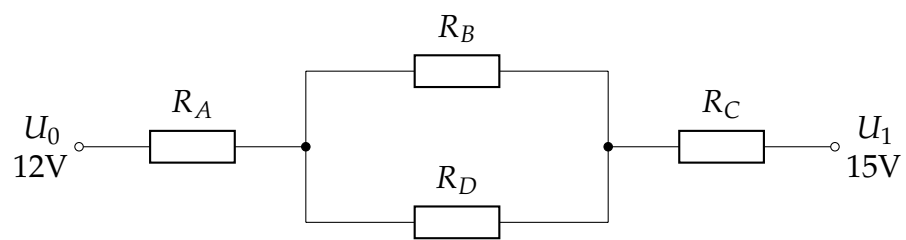
Both package *circuitikz* and *circ* can be used for plotting circuits. *circuitikz* is chosen in this template.

Use command “`texdoc circuitikz`” in your terminal to see its manual. And here is a [webpage](#) for introducing how to use it.

Here is an example:

```
\begin{figure}[H]
  \centering
  \begin{circuitikz}
    \draw (0,0) node [anchor=east] {\ctikzlabel{$\ U_0$}{12\si{V}}}} to [R,←
      l=$R_A$,o-*)
      (3,0) to[short] (3,1) to [R,l=$R_B$] (7,1)
      to[short] (7,0) to [R,l=$R_C$,*-o] (10,0) node [anchor=west] {\leftarrow
        ctikzlabel{$\ U_1$}{15\si{V}}}};
    \draw (3,0) to[short] (3,-1) to [R,l=$R_D$] (7,-1) to[short] (7,0);
  \end{circuitikz}
\end{figure}
```





■