

# The `eufrak` package

Frank Mittelbach      Rainer Schöpf  
Michael Downes  
Revised by David M. Jones

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## 1 Introduction

This package was written originally by Frank Mittelbach and Rainer Schöpf; later it was moved into the AMS- $\LaTeX$  distribution with only minor modifications. It is now part of the AMSFonts distribution; it can be used with  $\LaTeX 2_{\epsilon}$  with no dependency on the `amsmath` package.

This file sets up some font shape definitions to use the Euler Fraktur symbols in math mode. These fonts are part of the AMSFonts collection which can be found on many  $\TeX$  servers. It is also directly available from the AMS and from  $\TeX$  user groups.

`\EuFrak` To access the Euler Fraktur alphabet a *math alphabet identifier* called `\mathfrak` is provided. For example, the input

```
\[ \mathfrak{A} \neq \mathcal{A} \]
```

will produce

$$\mathfrak{A} \neq \mathcal{A}$$

Here is a complete table of the beautiful letters drawn by Hermann Zapf:

|                |                |                |                |                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| $\mathfrak{A}$ | $\mathfrak{B}$ | $\mathfrak{C}$ | $\mathfrak{D}$ | $\mathfrak{E}$ | $\mathfrak{F}$ | $\mathfrak{G}$ | $\mathfrak{H}$ | $\mathfrak{I}$ |
| $\mathfrak{J}$ | $\mathfrak{K}$ | $\mathfrak{L}$ | $\mathfrak{M}$ | $\mathfrak{N}$ | $\mathfrak{O}$ | $\mathfrak{P}$ | $\mathfrak{Q}$ | $\mathfrak{R}$ |
| $\mathfrak{S}$ | $\mathfrak{T}$ | $\mathfrak{U}$ | $\mathfrak{V}$ | $\mathfrak{W}$ | $\mathfrak{X}$ | $\mathfrak{Y}$ | $\mathfrak{Z}$ |                |

## 2 The Implementation

```
1 \NeedsTeXFormat{LaTeX2e}% LaTeX 2.09 can't be used (nor non-LaTeX)
2 [1994/12/01]% LaTeX date must be December 1994 or later
```

If the `amsfonts` package is already loaded, it doesn't really make sense to load `eufrak` as well.

```
3 \@ifpackageloaded{amsfonts}{%
4   \PackageWarning{eufrak}{The eufrak package is redundant if the
5     amsfonts package is used}%
6   \def\EuFrak{\mathfrak}% for bulletproofing
7   \endinput
8 }{}%
9 \ProvidesPackage{eufrak}[2009/06/22 v3.00 Euler Fraktur fonts]
```

`\EuFrak` Now we define the *math alphabet identifier* `\EuFrak` for both the normal and the bold math version

```
10 \DeclareMathAlphabet\EuFrak{U}{euf}{m}{n}
11 \SetMathAlphabet\EuFrak{bold}{U}{euf}{b}{n}
```

See the `amsfonts` package documentation for a discussion of the obsolescence of the `psamfonts` option.

```
12 \DeclareOption{psamfonts}{}%
```

Here is a table describing the action of the `eucal`, `euscript`, and `eufrak` packages.

| Package               | Option                 | Commands provided   |
|-----------------------|------------------------|---|
| <code>eucal</code>    | <code>none</code>      | <code>\mathcal</code>   |
| <code>eucal</code>    | <code>[mathcal]</code> | <code>\mathcal</code>   |
| <code>eucal</code>    | <code>[mathscr]</code> | <code>\mathscr</code> ( <code>\mathcal</code> unchanged)                      |
| <code>euscript</code> | <code>none</code>      | <code>\EuScript</code> (obsolete)   |
| <code>euscript</code> | <code>[mathcal]</code> | <code>\mathcal</code>   |
| <code>eufrak</code>   | <code>none</code>      | <code>\mathfrak</code> (also obsolete <code>\EuFrak</code> for compatibility) |

The preferred command name is `\mathfrak`, which for now just calls the old command name `\EuFrak`.

```
13 \newcommand{\mathfrak}{\EuFrak}
```

Process the package options.

```
14 \ProcessOptions
```

The usual `\endinput` to ensure that random garbage at the end of the file doesn't get copied by `docstrip`.

```
15 \endinput
```

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Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

| Symbols                                       | E   | N                                    |
|---|---|--------------------------------------|
| <code>\@ifpackageloaded</code> .. 3           | <code>\endinput</code> ..... 2                      | <code>\NeedsTeXFormat</code> .... 1  |
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| <code>[mathscr]</code> option .... 2          | <code>\EuFrak</code> ..... 1,<br>1, 2, 2, 6, 10, 13 |                                      |
|   | <code>eufrak</code> package 1, 1, 2, 2              | <b>P</b>                             |
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|   |   | <code>psamfonts</code> option .... 1 |
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