

Building and using bffb

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In boldface definitions, boldface section titles, etc., `\bf\boldmath` almost works, but it doesn't affect `\mathbb`: for example, it turns $\mathbb{Z}/12\mathbb{Z}$ into $\mathbb{Z}/12\mathbb{Z}$.

Solution: replace `\bf\boldmath` with `\mybf`, which turns $\mathbb{Z}/12\mathbb{Z}$ into $\mathbf{Z}/12\mathbf{Z}$. Internally, `\mybf` uses a new font `bffb` that thickens the `\mathbb` lines, leaving a slight space between the lines. More examples (see macro definitions below):

\mathbb{Z}	<code>\$\$\mathbb{Z}\$\$</code>
\mathbf{Z}	<code>\$\$\mathbf{Z}\$\$</code>
\mathbf{Z}	<code>{\mybf \$\mathbb{Z}\$}</code>
$\mathbb{Z}/12\mathbb{Z}$	<code>\$\$\mathbb{Z}/12\mathbb{Z}\$\$</code>
$\mathbf{Z}/12\mathbf{Z}$	<code>{\mybf \$\mathbb{Z}/12\mathbb{Z}\$}</code>
$\text{Hom}_{\mathbb{Z}/12}$	<code>\$\$\operatorname{Hom}_{\mathbb{Z}/12}\$\$</code>
$\mathbf{Hom}_{\mathbf{Z}/12}$	<code>{\mybf \$\operatorname{Hom}_{\mathbb{Z}/12}\$}</code>

Horizontal spacing for `bffb` is slightly wider than regular `bfb`:

$ABCDEFGHIJKLMN$ $OPQRSTUVWXYZ$ $+xyz$	text XYZ
$\mathbf{ABCDEFGHIJKLMN}$ $\mathbf{OPQRSTUVWXYZ}$ $\mathbf{+xyz}$	$\mathbf{\text{text XYZ}}$

Some files attached to this PDF: A simple `bffb.py` script uses `mfttrace` to convert some `amsfonts` files into `bffb.tfm` and `bffb.ttf` in this directory. This document is produced by `bffb.tex`, which uses the following packages and macros, which rely on this directory having `bffb.tfm` and `bffb.ttf`:

```

\usepackage{fontspec}
\usepackage{amsfonts}
\usepackage{amsmath}
\def\mathbfbfb#1{\text{\normalfont\fontspec{bffb.ttf}#1}}
\def\mybf{\bf\boldmath\let\mathbb\mathbfbfb}
\def\Z{\mathbb{Z}}

```

This has been tested in both `xelatex` and `lualatex`. It won't work in `pdflatex`.

A different approach, without a separate `bffb` font, is

```

$\pdfliteral{2 Tr 0.25 w}\mathbb{Z}\pdfliteral{0 Tr 0 w}$

```

in `lualatex` after `\usepackage{luatex85}`. A variant that works in both `xelatex` and `lualatex` (see also `xfakebold`, which also covers `pdflatex`) is

```

$\special{pdf:literal 2 Tr 0.25 w}\mathbb{Z}
\special{pdf:literal 0 Tr 0 w}$

```

producing \mathbf{Z} (vs. `bffb` \mathbf{Z} and regular \mathbb{Z} ; side by side: \mathbf{ZZZ}), but this scales badly in some PDF readers (e.g., Evince), appearing much too heavy when the user zooms out.

There's also `$$\pmb{\mathbb{Z}}$$` producing \mathbf{Z} , which looks okay from a distance but not close up. More options: `DSSerif`; `mathalpha`.