The pxpgftate package

PGF/Ti*k*Z in the vertical (tate) direction of (u)pLaTeX

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https://github.com/munepi/pxpgftate

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1 Introduction

In the vertical (tate) direction of pTeX and upTeX, the DVI drivers place the characters rotated, but PGF draws its pictures in the unrotated page coordinate system. Without this package,

- pictures in tate text come out sideways relative to the text (`dvipdfmx`);
- shadings, patterns and fadings stop pLaTeX with

  ```
  ! Incompatible direction list can't be unboxed.
  ```

  because the material that PGF collects for the beginning of the page is set in the tate direction, but unboxed at shipout in the yoko direction;
- `remember picture`, `overlay` and the `current page` node use page positions that are not rotated into the picture.

With this package, a picture that begins in the tate direction is rotated like the surrounding text: its x-axis points in the direction of the line (downwards) and its y-axis points to the right. Text in nodes is typeset in the tate direction. The direction is determined at the beginning of each picture, so yoko boxes inside tate text keep working as before.

Supported:

- paths, nodes, transformations (`rotate`, `transform shape`), colors;
- shadings, patterns, fadings, transparency groups;
- `remember picture`, `overlay` and the `current page` node;
- tcolorbox (also `enhanced`, `breakable`, `drop shadow`).

Figure 1 shows the top of the first page of the test document `test-pxpgftate.tex`, typeset with upLaTeX and `dvipdfmx`.

The package is meant for TeX Live 2012 up to the release of PGF that supports the tate direction itself. When the loaded PGF supports it already (it defines `\pgfsys@ptex@tate@supported`), the package does nothing.

2 Requirements

- pLaTeX or upLaTeX (TeX Live 2012 or later);
- PGF 2.10 or later;
- the `dvipdfmx` or `dvips` driver. With other drivers, and with engines other than pTeX and upTeX, the package does nothing.

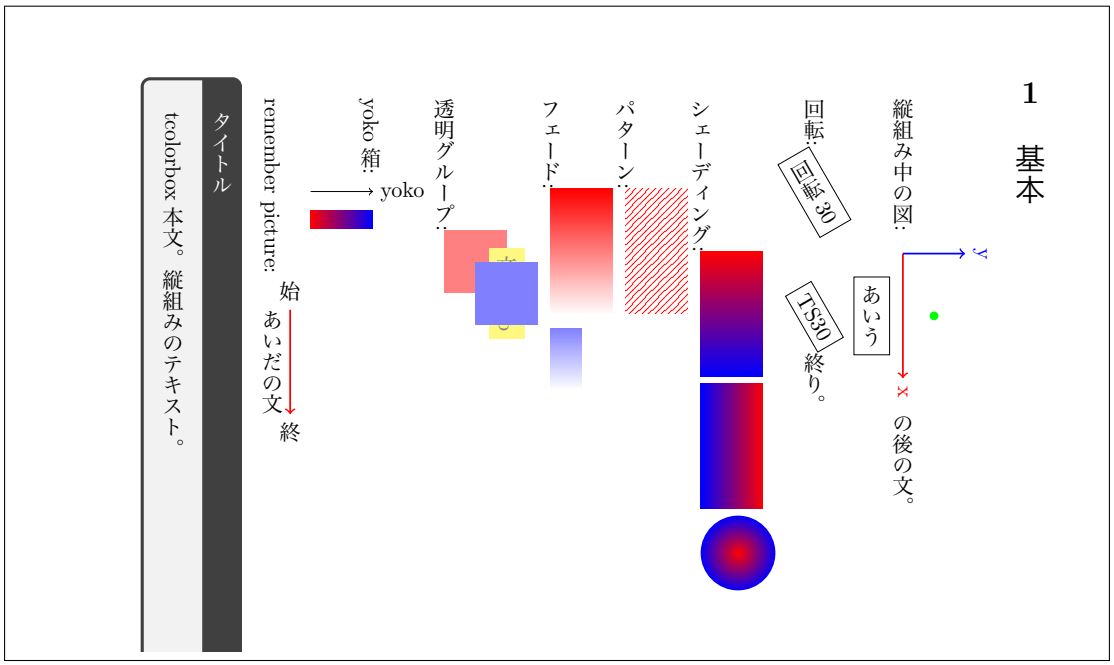


Figure 1: `test-pxpgftate.tex` (utarticle, upLaTeX + `dvipdfmx`, top of page 1). Read the columns from right to left.

3 Usage

Load the package after tikz (or pgf):

```
\documentclass[dvipdfmx]{tarticle}
\usepackage{tikz}
\usepackage{pxpgftate}
\begin{document}
...\tikz\draw[->] (0,0) -- (1,0);...
\end{document}
```

Loading it before PGF works, too; the patches are then applied at `\begin{document}`. The package has no options. It writes to the log which driver it patched, or why it does nothing.

4 When PGF supports the tate direction itself

Support for the tate direction has also been proposed for PGF itself (pgf-tikz/pgf#1487). Once a release of PGF includes it, PGF handles pictures in tate text by itself, and this package does nothing: it leaves PGF alone and only writes the following to the log:

```
Package pxpgftate Info: PGF supports the tate direction itself.
(pxpgftate)             Nothing is done on input line ....
```

So you can keep `\usepackage{pxpgftate}` in your documents: they work both with older TeX Live (where the package does the work) and with newer TeX Live (where PGF does it), and look the same. You may remove the line once you use only a PGF with the native support.

5 What it changes

The package wraps the driver macros of PGF instead of copying them, so that the same code works with the different PGF versions of TeX Live 2012–2026. It does not replace any file of PGF.

- `\pgfsys@beginpicture`, `\pgfsys@endpicture`: rotate the picture in the tate direction (`dvipdfmx`; `dvips` rotates PostScript specials by itself).
- `\pgfsys@hbox`, `\pgfsys@hboxsynced`, `\pgfsys@transparencygroupfrombox`: undo the rotation around the current point for boxes and XObjects (`dvipdfmx`). This uses `pdf:bcontent` rather than `pdf:btrans`, which is misplaced inside `pdf:bcontent` and in XObjects with `dvipdfmx` before TeX Live 2021. With PGF 2.10 (TeX Live 2012), the box macros of PGF 3.0 are used in tate pictures, since the ones of PGF 2.10 only work in unrotated pictures.
- `\pgfsys@getposition`, `current page`: rotate page positions into the coordinate system of a tate picture.
- `\pgfutil@insertatbegincurrentpagefrombox`, `\pgfdeclarefading`, `\tikzfadingfrompicture`, `\tikzfading`: always use the yoko direction, since this material is unboxed at shipout in the yoko direction.
- With LaTeX before 2020-10-01 and everyshi v3: the shipout hooks are run in the yoko direction, as the pxeveryshi package does. This affects all users of everyshi in tate documents. Nothing is done when pxeveryshi is loaded.

6 Limitations

- Only the tate direction is handled; the `\dtou` direction is not.
- Fadings are always defined in the yoko direction, also when they are declared in tate text.
- `remember picture`, `overlay` and `current page` need the position tracking of PGF, which PGF enables for pLaTeX only from TeX Live 2018 on. This is the same in yoko documents.
- With `dvips`, fadings need a PGF that supports them with `dvips` (not the one of TeX Live 2016 or earlier), and Japanese fonts need the usual font map setup for `dvips` and Ghostscript. Both are independent of this package.

7 Tests

The repository ships `test-pxpgftate.tex`, which exercises all the features listed above. `make test` typesets it with the installed TeX Live, with pLaTeX and upLaTeX, `dvipdfmx` and `dvips`, and checks that there are no errors and that pxpgftate patched the driver. `make test-matrix` (`run-matrix.sh`, not part of the CTAN archive) does the same with every TeX Live from 2012 to 2026 (installed in `/opt/texlive/`⟨*year*⟩), and renders the first page of each result for a visual check.

8 History

This package grew out of patches for PGF in the tate direction that the author has been developing since 2015 for book production with pLaTeX and `dvipdfmx`. In 2024 they were put together as `pgfsys-dvipdfmx-ptextate.sty` and two patched copies of `pgfutil-latex.def`. The package was then rewritten to patch PGF without replacing its files, and extended to `dvips` and to the PGF versions of TeX Live 2012–2026.

v1.0 (2026/11/04) First release.

9 License

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