The packages of the PSNFSS bundle

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The source file `psfonts.dtx` contains suitable package files to use common PostScript fonts with LaTeX. See the file `00readme.txt` for the installation instructions; it also explains how to obtain the related Type1 fonts, font definition files, font metrics and virtual fonts.

See the document 'Using common PostScript fonts with LaTeX', filename `psnfss2e.pdf`, for a description of the user interface.

1 The **times** package

```
⟨*times⟩
\renewcommand{\sfdefault}{phv}
\renewcommand{\rmdefault}{ptm}
\renewcommand{\ttdefault}{pcr}
⟨/times⟩
```

2 The **palatino** package

```
⟨*palatino⟩
\renewcommand{\rmdefault}{ppl}
\renewcommand{\sfdefault}{phv}
\renewcommand{\ttdefault}{pcr}
⟨/palatino⟩
```

3 The **helvet** package

Options processing uses the keyval package and a hack borrowed from hyperref:

```
⟨*helvet⟩
\RequirePackage{keyval}
\define@key{Hel}{scaled}[.95]{%
  \def\Hv@scale{#1}}
\def\ProcessOptionsWithKV#1{%
  \let\@tempc\relax
  \let\Hv@tempa\@empty
  \ifx\@classoptionslist\relax\else
    \@for\CurrentOption:=\@classoptionslist\do{%
      \@ifundefined{KV@#1@\CurrentOption}%
      {}%
      {%
        \edef\Hv@tempa{\Hv@tempa,\CurrentOption,}%
        \@expandtwoargs\@removeelement\CurrentOption
          \@unusedoptionlist\@unusedoptionlist
      }%
    }%
  \fi
  \edef\Hv@tempa{%
    \noexpand\setkeys{#1}{%
      \Hv@tempa\@ptionlist{\@currname.\@currext}%
```

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```
    }%
  }%
  \Hv@tempa
  \let\CurrentOption\@empty
}
\ProcessOptionsWithKV{Hel}
\AtEndOfPackage{%
  \let\@unprocessedoptions\relax
}
```

The `.fd` files will evaluate the macro `\Hv@scale` and scale Helvetica appropriately.

Now it's time to redefine the default sans font:

```
\renewcommand{\sfdefault}{phv}
⟨/helvet⟩
```

4 The **avant** package

```
⟨*avant⟩
\renewcommand{\sfdefault}{pag}
⟨/avant⟩
```

5 The **newcent** package

```
⟨*newcent⟩
\renewcommand{\rmdefault}{pnc}
\renewcommand{\sfdefault}{pag}
\renewcommand{\ttdefault}{pcr}
⟨/newcent⟩
```

6 The **bookman** package

```
⟨*bookman⟩
\renewcommand{\rmdefault}{pbk}
\renewcommand{\sfdefault}{pag}
\renewcommand{\ttdefault}{pcr}
⟨/bookman⟩
```

7 The **courier** package

```
⟨*courier⟩
\renewcommand{\ttdefault}{pcr}
⟨/courier⟩
```

8 The **pifont** package

Some useful commands for Pi fonts (Dingbats, Symbol etc); they all assume you know the character number of the (unmapped) font

```
⟨*pifont⟩
\newcommand{\Pifont}[1]{\fontfamily{#1}\fontencoding{U}%
\fontseries{m}\fontshape{n}\selectfont}
\newcommand{\Pisymbol}[2]{{\Pifont{#1}\char#2}}
\newcommand{\Pifill}[2]{\leavevmode
  \leaders\hbox{\makebox[0.2in]{\Pisymbol{#1}{#2}}}\hfill
  \kern\z@}
\newcommand{\Piline}[2]{\par\noindent\hspace{0.5in}\Pifill{#1}{#2}%
   \hspace{0.5in}\kern\z@\par}
\newenvironment{Pilist}[2]%
{\begin{list}{\Pisymbol{#1}{#2}}{}}%
{\end{list}}%
```

A Pi number generator (from ideas by David Carlisle), for use in lists where items are suffixed by symbols taken in sequence from a Pi font. Usage is in lists just like enumerate.

`\Pinumber` outputs the appropriate symbol, where `#2` is the name of a LaTeX counter and `#1` is the font family.

```
\def\Pinumber#1#2{\protect\Pisymbol{#1}{\arabic{#2}}}
\newenvironment{Piautolist}[2]{%
\ifnum \@enumdepth >3 \@toodeep\else
  \advance\@enumdepth \@ne
```

We force the labels and cross-references into a very plain style (e.g., no brackets around 'numbers', or dots after them).

```
      \edef\@enumctr{enum\romannumeral\the\@enumdepth}%
  \expandafter\def\csname p@enum\romannumeral\the\@enumdepth\endcsname{}%
  \expandafter\def\csname labelenum\romannumeral\the\@enumdepth\endcsname{%
     \csname theenum\romannumeral\the\@enumdepth\endcsname}%
  \expandafter\def\csname theenum\romannumeral\the\@enumdepth\endcsname{%
     \Pinumber{#1}{enum\romannumeral\the\@enumdepth}}%
  \list{\csname label\@enumctr\endcsname}{%
        \@nmbrlisttrue
        \def\@listctr{\@enumctr}%
        \setcounter{\@enumctr}{#2}%
        \addtocounter{\@enumctr}{-1}%
        \def\makelabel##1{\hss\llap{##1}}}
\fi
}{\endlist}
```

All the old Dingbat commands still work; they are now implemented using the `\Pi...` commands.

```
\newcommand{\ding}{\Pisymbol{pzd}}
\def\dingfill#1{\Pifill{pzd}{#1}}
\def\dingline#1{\Piline{pzd}{#1}}
\newenvironment{dinglist}[1]{\begin{Pilist}{pzd}{#1}}%
  {\end{Pilist}}
\newenvironment{dingautolist}[1]{\begin{Piautolist}{pzd}{#1}}%
  {\end{Piautolist}}
{\Pifont{pzd}}
{\Pifont{psy}}
⟨/pifont⟩
```

9 The chancery package

```
⟨*chancery⟩
\renewcommand{\rmdefault}{pzc}
⟨/chancery⟩
```

10 The mathptm and mathptmx packages

Setting up the fonts for mathptm:

```
⟨*mathptm⟩
\PackageWarningNoLine{mathptm}{%
  This package is to be regarded as obsolete.\MessageBreak
  See the PSNFSS documentation}
\def\rmdefault{ptm}
\DeclareSymbolFont{operators}   {OT1}{ptmcm}{m}{n}
\DeclareSymbolFont{letters}     {OML}{ptmcm}{m}{it}
\DeclareSymbolFont{symbols}     {OMS}{pzccm}{m}{n}
\DeclareSymbolFont{largesymbols}{OMX}{psycm}{m}{n}
\DeclareSymbolFont{bold}        {OT1}{ptm}{bx}{n}
\DeclareSymbolFont{italic}      {OT1}{ptm}{m}{it}
⟨/mathptm⟩
```

Setting up the fonts for mathptmx:

```
⟨*mathptmx⟩
\def\rmdefault{ptm}
```

```
\DeclareSymbolFont{operators}   {OT1}{ztmcm}{m}{n}
\DeclareSymbolFont{letters}     {OML}{ztmcm}{m}{it}
\DeclareSymbolFont{symbols}     {OMS}{ztmcm}{m}{n}
\DeclareSymbolFont{largesymbols}{OMX}{ztmcm}{m}{n}
\DeclareSymbolFont{bold}        {OT1}{ptm}{bx}{n}
\DeclareSymbolFont{italic}      {OT1}{ptm}{m}{it}
⟨/mathptmx⟩
```

Define `\mathbf` and `\mathit`:

```
⟨*mathptm | mathptmx⟩
\@ifundefined{mathbf}{}{\DeclareMathAlphabet{\mathbf}{OT1}{ptm}{bx}{n}}
\@ifundefined{mathit}{}{\DeclareMathAlphabet{\mathit}{OT1}{ptm}{m}{it}}
```

An `\omicron` command, to fill the gap:

```
\DeclareMathSymbol{\omicron}{0}{operators}{`\o}
```

Lock unavailabe symbols:

```
\renewcommand{\jmath}{%
  \PackageError
⟨mathptm⟩   {mathptm}
⟨mathptmx⟩  {mathptmx}
  {The symbols \protect\jmath, \protect\amalg\space and
  \protect\coprod\MessageBreak
  are not available with this package}
  {Type \space <return> \space to proceed;
  your command will be ignored.}}
\let\amalg=\jmath
\let\coprod=\jmath
```

Reduce the space around math operators:

```
\thinmuskip=2mu
\medmuskip=2.5mu plus 1mu minus 1mu
\thickmuskip=4mu plus 1.5mu minus 1mu
⟨/mathptm | mathptmx⟩
```

Make `\hbar` work with Times.

```
⟨*mathptm⟩
\def\hbar{{\mskip1.6mu\mathchar'26\mkern-7.6muh}}
⟨/mathptm⟩
```

With mathptmx, PSNFSS 9.0 and later is using an improved definition, which was adopted from Frank Mittelbach's mathtime package:

```
⟨*mathptmx⟩
\DeclareRobustCommand\hbar{{%
 \dimen@.03em%
 \dimen@ii.06em%
 \def\@tempa##1##2{{%
   \lower##1\dimen@\rlap{\kern##1\dimen@ii\the##2 0\char22}}}%
 \mathchoice\@tempa\@ne\textfont
            \@tempa\@ne\textfont
            \@tempa\defaultscriptratio\scriptfont
            \@tempa\defaultscriptscriptratio\scriptscriptfont
  h}}
⟨/mathptmx⟩
```

No bold math:

```
⟨*mathptm | mathptmx⟩
\def\boldmath{%
   \PackageWarning%
⟨mathptm⟩    {mathptm}%
⟨mathptmx⟩   {mathptmx}%
   {There are no bold math fonts}%
   \global\let\boldmath=\relax
}
⟨/mathptm | mathptmx⟩
```

Use larger font sizes for super- and subscripts:

```
⟨*mathptmx⟩
\def\defaultscriptratio{.74}
\def\defaultscriptscriptratio{.6}
⟨/mathptmx⟩
⟨*mathptm | mathptmx⟩
\DeclareMathSizes{5}{5}{5}{5}
\DeclareMathSizes{6}{6}{5}{5}
\DeclareMathSizes{7}{7}{5}{5}
\DeclareMathSizes{8}{8}{6}{5}
\DeclareMathSizes{9}{9}{7}{5}
\DeclareMathSizes{10}{10}{7.4}{6}
\DeclareMathSizes{10.95}{10.95}{8}{6}
\DeclareMathSizes{12}{12}{9}{7}
\DeclareMathSizes{14.4}{14.4}{10.95}{8}
\DeclareMathSizes{17.28}{17.28}{12}{10}
\DeclareMathSizes{20.74}{20.74}{14.4}{12}
\DeclareMathSizes{24.88}{24.88}{17.28}{14.4}
⟨/mathptm | mathptmx⟩
```

Option: Use slanted greek capitals (with mathptmx only):

```
⟨*mathptmx⟩
\DeclareOption{slantedGreek}{%
  \DeclareMathSymbol{\Gamma}{\mathalpha}{letters}{0}
  \DeclareMathSymbol{\Delta}{\mathalpha}{letters}{1}
  \DeclareMathSymbol{\Theta}{\mathalpha}{letters}{2}
  \DeclareMathSymbol{\Lambda}{\mathalpha}{letters}{3}
  \DeclareMathSymbol{\Xi}{\mathalpha}{letters}{4}
  \DeclareMathSymbol{\Pi}{\mathalpha}{letters}{5}
  \DeclareMathSymbol{\Sigma}{\mathalpha}{letters}{6}
  \DeclareMathSymbol{\Upsilon}{\mathalpha}{letters}{7}
  \DeclareMathSymbol{\Phi}{\mathalpha}{letters}{8}
  \DeclareMathSymbol{\Psi}{\mathalpha}{letters}{9}
  \DeclareMathSymbol{\Omega}{\mathalpha}{letters}{10}
}
\DeclareMathSymbol{\upGamma}{\mathord}{operators}{0}
\DeclareMathSymbol{\upDelta}{\mathord}{operators}{1}
\DeclareMathSymbol{\upTheta}{\mathord}{operators}{2}
\DeclareMathSymbol{\upLambda}{\mathord}{operators}{3}
\DeclareMathSymbol{\upXi}{\mathord}{operators}{4}
\DeclareMathSymbol{\upPi}{\mathord}{operators}{5}
\DeclareMathSymbol{\upSigma}{\mathord}{operators}{6}
\DeclareMathSymbol{\upUpsilon}{\mathord}{operators}{7}
\DeclareMathSymbol{\upPhi}{\mathord}{operators}{8}
\DeclareMathSymbol{\upPsi}{\mathord}{operators}{9}
\DeclareMathSymbol{\upOmega}{\mathord}{operators}{10}
```

Options processing:

```
\ProcessOptions\relax
⟨/mathptmx⟩
```

```
⟨*mathptm | mathptmx⟩
\let\s@vedhbar\hbar
\AtBeginDocument{%
⟨/mathptm | mathptmx⟩
```

Ensure proper scaling of the AMS fonts, even when not used through the amssymb or amsfonts packages (mathptmx only):

```
⟨*mathptmx⟩
  \DeclareFontFamily{U}{msa}{}%
  \DeclareFontShape{U}{msa}{m}{n}{<->msam10}{}%
  \DeclareFontFamily{U}{msb}{}%
  \DeclareFontShape{U}{msb}{m}{n}{<->msbm10}{}%
  \DeclareFontFamily{U}{euf}{}%
```

```
  \DeclareFontShape{U}{euf}{m}{n}{<-6>eufm5<6-8>eufm7<8->eufm10}{}%
  \DeclareFontShape{U}{euf}{b}{n}{<-6>eufb5<6-8>eufb7<8->eufb10}{}%
⟨/mathptmx⟩
```

In case the amsfonts package is loaded additionally, we must restore our `\hbar`:

```
⟨*mathptm | mathptmx⟩
  \@ifpackageloaded{amsfonts}{\let\hbar\s@vedhbar}{}
```

Take care of `\big` & friends working with scaled math extension font, unless amsmath.sty is also loaded:

```
  \@ifpackageloaded{amsmath}{}{%
    \newdimen\big@size
    \addto@hook\every@math@size{\setbox\z@\vbox{\hbox{$($}\kern\z@}%
       \global\big@size 1.2\ht\z@}
    \def\bBigg@#1#2{%
       {\hbox{$\left#2\vcenter to#1\big@size{}\right.\n@space$}}}
    \def\big{\bBigg@\@ne}
    \def\Big{\bBigg@{1.5}}
    \def\bigg{\bBigg@\tw@}
    \def\Bigg{\bBigg@{2.5}}
  }
}
⟨/mathptm | mathptmx⟩
```

Credits

The virtual mathptm and mathptmx fonts and the related packages were created by Alan Jeffrey, Sebastian Rahtz and Ulrik Vieth.

11 The mathpple package

Suppress info about math fonts being redefined:

```
⟨*mathpple⟩
\PackageWarningNoLine{mathpple}{%
  This package is to be regarded as obsolete.\MessageBreak
  See the PSNFSS documentation}
\let\s@ved@info\@font@info
\let\@font@info\@gobble
```

Make Palatino the default roman font:

```
\renewcommand{\rmdefault}{ppl}
```

Typeset mathematics using the mathpple fonts:

```
\DeclareSymbolFont{operators}   {OT1}{zpple}{m}{n}
\DeclareSymbolFont{letters}     {OML}{zpple}{m}{it}
\DeclareSymbolFont{symbols}     {OMS}{zpple}{m}{n}
\DeclareSymbolFont{largesymbols}{OMX}{zpple}{m}{n}
\DeclareMathAlphabet{\mathbf}   {OT1}{zpple}{b}{n}
\DeclareMathAlphabet{\mathit}   {OT1}{ppl}{m}{it}
```

Support for bold mathversion:

```
\SetSymbolFont{operators}{bold}{OT1}{zpple}{b}{n}
\SetSymbolFont{letters}{bold}{OML}{zpple}{b}{it}
\SetSymbolFont{symbols}{bold}{OMS}{zpple}{b}{n}
\SetSymbolFont{largesymbols}{bold}{OMX}{zpple}{m}{n}
\SetMathAlphabet\mathit{bold}{OT1}{ppl}{b}{it}
```

Reduce the space around math operators:

```
%\thinmuskip=2.5mu
\medmuskip=3.5mu plus 1mu minus 1mu
%\thickmuskip=4.5mu plus 1.5mu minus 1mu
```

Compensate for increased letter spacing

```
\def\joinrel{\mathrel{\mkern-3.45mu}}
```

Make \hbar work with Palatino:

```
\def\hbar{{\mathchar'26\mkern-7muh}}
```

Define a new math alphabet for bold italic variables:

```
\DeclareMathAlphabet{\mathbold}{OML}{zpple}{b}{it}
```

Make \mathbold act on lowercase greek, too:

```
\DeclareMathSymbol{\alpha}{\mathalpha}{letters}{11}
\DeclareMathSymbol{\beta}{\mathalpha}{letters}{12}
\DeclareMathSymbol{\gamma}{\mathalpha}{letters}{13}
\DeclareMathSymbol{\delta}{\mathalpha}{letters}{14}
\DeclareMathSymbol{\epsilon}{\mathalpha}{letters}{15}
\DeclareMathSymbol{\zeta}{\mathalpha}{letters}{16}
\DeclareMathSymbol{\eta}{\mathalpha}{letters}{17}
\DeclareMathSymbol{\theta}{\mathalpha}{letters}{18}
\DeclareMathSymbol{\iota}{\mathalpha}{letters}{19}
\DeclareMathSymbol{\kappa}{\mathalpha}{letters}{20}
\DeclareMathSymbol{\lambda}{\mathalpha}{letters}{21}
\DeclareMathSymbol{\mu}{\mathalpha}{letters}{22}
\DeclareMathSymbol{\nu}{\mathalpha}{letters}{23}
\DeclareMathSymbol{\xi}{\mathalpha}{letters}{24}
\DeclareMathSymbol{\pi}{\mathalpha}{letters}{25}
\DeclareMathSymbol{\rho}{\mathalpha}{letters}{26}
\DeclareMathSymbol{\sigma}{\mathalpha}{letters}{27}
\DeclareMathSymbol{\tau}{\mathalpha}{letters}{28}
\DeclareMathSymbol{\upsilon}{\mathalpha}{letters}{29}
\DeclareMathSymbol{\phi}{\mathalpha}{letters}{30}
\DeclareMathSymbol{\chi}{\mathalpha}{letters}{31}
\DeclareMathSymbol{\psi}{\mathalpha}{letters}{32}
\DeclareMathSymbol{\omega}{\mathalpha}{letters}{33}
\DeclareMathSymbol{\varepsilon}{\mathalpha}{letters}{34}
\DeclareMathSymbol{\vartheta}{\mathalpha}{letters}{35}
\DeclareMathSymbol{\varpi}{\mathalpha}{letters}{36}
\DeclareMathSymbol{\varphi}{\mathalpha}{letters}{39}
\let\varrho\rho
\let\varsigma\sigma
```

We redefine the default sizes for super- and subscripts. Palatino, like most other type 1 fonts, is scaled linearly, so the default ratios (.7 and .5) may produce unreadably small characters:

```
\def\defaultscriptratio{.76}
\def\defaultscriptscriptratio{.6}
```

These default ratios are not used for any sizes that have been explicitly declared, so we redeclare the sizes used by the standard classes. At least for the lower sizes this is important as we don't want to end up with a 5pt font being reduced even further:

```
\DeclareMathSizes{5}    {5}    {5}    {5}
\DeclareMathSizes{6}    {6}    {5}    {5}
\DeclareMathSizes{7}    {7}    {5}    {5}
\DeclareMathSizes{8}    {8}    {6}    {5}
\DeclareMathSizes{9}    {9}    {7}    {5}
\DeclareMathSizes{10}   {10}   {7.6}  {6}
\DeclareMathSizes{10.95}{10.95}{8}    {6}
\DeclareMathSizes{12}   {12}   {9}    {7}
\DeclareMathSizes{14.4} {14.4} {10}   {8}
\DeclareMathSizes{17.28}{17.28}{12}   {10}
\DeclareMathSizes{20.74}{20.74}{14.4} {12}
\DeclareMathSizes{24.88}{24.88}{20.74}{14.4}
```

Option: Use slanted greek capitals:

```
\DeclareOption{slantedGreek}{%
  \DeclareMathSymbol{\Gamma}{\mathalpha}{letters}{0}
  \DeclareMathSymbol{\Delta}{\mathalpha}{letters}{1}
```

```
  \DeclareMathSymbol{\Theta}{\mathalpha}{letters}{2}
  \DeclareMathSymbol{\Lambda}{\mathalpha}{letters}{3}
  \DeclareMathSymbol{\Xi}{\mathalpha}{letters}{4}
  \DeclareMathSymbol{\Pi}{\mathalpha}{letters}{5}
  \DeclareMathSymbol{\Sigma}{\mathalpha}{letters}{6}
  \DeclareMathSymbol{\Upsilon}{\mathalpha}{letters}{7}
  \DeclareMathSymbol{\Phi}{\mathalpha}{letters}{8}
  \DeclareMathSymbol{\Psi}{\mathalpha}{letters}{9}
  \DeclareMathSymbol{\Omega}{\mathalpha}{letters}{10}
}
\let\upOmega\Omega
\let\upDelta\Delta
```

Options processing:

```
\ProcessOptions\relax
```

```
\let\s@vedhbar\hbar
\AtBeginDocument{%
```

Ensure proper scaling of the AMS fonts, even when not used through the amssymb or amsfonts packages:

```
  \DeclareFontFamily{U}{msa}{}%
  \DeclareFontShape{U}{msa}{m}{n}{<->s*[1.042]msam10}{}%
  \DeclareFontFamily{U}{msb}{}%
  \DeclareFontShape{U}{msb}{m}{n}{<->s*[1.042]msbm10}{}%
  \DeclareFontFamily{U}{euf}{}%
  \DeclareFontShape{U}{euf}{m}{n}{<-6>eufm5<6-8>eufm7<8->eufm10}{}%
  \DeclareFontShape{U}{euf}{b}{n}{<-6>eufb5<6-8>eufb7<8->eufb10}{}%
```

In case the amsfonts package is loaded additionally, we must restore our `\hbar`:

```
  \@ifpackageloaded{amsfonts}{\let\hbar\s@vedhbar}{}
```

Take care of `\big` & friends working with scaled math extension font, unless amsmath.sty is also loaded:

```
  \@ifpackageloaded{amsmath}{}{%
    \newdimen\big@size
    \addto@hook\every@math@size{\setbox\z@\vbox{\hbox{$($}\kern\z@}%
       \global\big@size 1.2\ht\z@}
    \def\bBigg@#1#2{%
       {\hbox{$\left#2\vcenter to#1\big@size{}\right.\n@space$}}}
    \def\big{\bBigg@\@ne}
    \def\Big{\bBigg@{1.5}}
    \def\bigg{\bBigg@\tw@}
    \def\Bigg{\bBigg@{2.5}}
  }
}
```

Restore font info:

```
\let\@font@info\s@ved@info
```

⟨/mathpple⟩

Credits

mathpple is based on the package mathppl and the related virtual fonts, created by Aloysius Helminck. These were distributed in conjunction with FONTINST v1.335, but are no longer available from CTAN. The main changes with regard to Helminck's model are:

- italic Greek letters from the Euler fonts;
- `\mathcal` from CM instead of Zapf Chancery;
- positioning of math accents substantially improved;
- improved spacing;

- use those Type 1 fonts only, which are part of the free 'BlueSky' distribution.

Special thanks to Daniel Schlieper, who suggested the development of the mathpple package, contributed many good ideas and helped with testing.

12 The charter package

```
⟨*charter⟩
\renewcommand{\rmdefault}{bch}
\renewcommand{\bfdefault}{b}
⟨/charter⟩
```

13 The utopia package

```
⟨*utopia⟩
\PackageWarningNoLine{utopia}{%
  This package is to be regarded as obsolete.\MessageBreak
  See the PSNFSS documentation}
\renewcommand{\rmdefault}{put}
\renewcommand\bfdefault{b}
⟨/utopia⟩
```

14 The mathpazo package

Suppress info about math fonts being redefined:

```
⟨*mathpazo⟩
\let\s@ved@info\@font@info
\let\@font@info\@gobble
```

Options processing:

```
\newif\ifpazo@osf
\newif\ifpazo@sc
\newif\ifpazo@slGreek
\newif\ifpazo@BB \pazo@BBtrue
\DeclareOption{osf}{\pazo@osftrue}
\DeclareOption{sc}{\pazo@sctrue}
\DeclareOption{slantedGreek}{\pazo@slGreektrue}
\DeclareOption{noBBpl}{\pazo@BBfalse}
\DeclareOption{osfeqnnum}{\OptionNotUsed}
\ProcessOptions\relax
```

Make Palatino (`ppl`) the default roman font. If the options `osf` or `sc` were specified, use `pplj` or `pplx` instead, and make sure that `\oldstylenums` switches to `pplj`, too.

```
\ifpazo@osf
  \renewcommand{\rmdefault}{pplj}
  \renewcommand{\oldstylenums}[1]{%
    {\fontfamily{pplj}\selectfont #1}}
\else\ifpazo@sc
  \renewcommand{\rmdefault}{pplx}
  \renewcommand{\oldstylenums}[1]{%
    {\fontfamily{pplj}\selectfont #1}}
\else
  \renewcommand{\rmdefault}{ppl}
\fi\fi
```

The Pazo fonts provide an Euro symbol, which is now available in the Palatino text companion fonts. For the sake of compatibility, we still define the macro `\ppleuro`, which was introduced with version 8.2, and we make it work with the eurofont and europs packages:

```
\newcommand{\ppleuro}{{\fontencoding{U}\fontfamily{fplm}\selectfont \char160}}
\AtBeginDocument{\@ifpackageloaded{europs}{\renewcommand{\EURtm}{\ppleuro}}{}}
```

Now we declare the math fonts. The mathpazo package uses a Palatino text font family with OT1 encoding as the `operators` and `\mathit` alphabets. If the `sc` option was specified, we use the family `pplx`. Otherwise we just take `ppl`, thus making sure that no oldstyle digits are used in math mode. Note that specifying both `sc` and `osf` gives oldstyle numbers in text and uses the family `pplx` in math mode, so that the `ppl` family is not required at all. Thus, the number of TFM's loaded by TEX is minimized.

```
\ifpazo@sc
 \DeclareSymbolFont{operators}     {OT1}{pplx}{m}{n}
 \SetSymbolFont{operators}{bold}   {OT1}{pplx}{b}{n}
 \DeclareMathAlphabet{\mathit}     {OT1}{pplx}{m}{it}
 \SetMathAlphabet{\mathit}{bold}   {OT1}{pplx}{b}{it}
\else
 \DeclareSymbolFont{operators}     {OT1}{ppl}{m}{n}
 \SetSymbolFont{operators}{bold}   {OT1}{ppl}{b}{n}
 \DeclareMathAlphabet{\mathit}     {OT1}{ppl}{m}{it}
 \SetMathAlphabet{\mathit}{bold}   {OT1}{ppl}{b}{it}
\fi
```

Uppercase upright Greek and math symbols such as 'plus', 'equal' and others are taken from a new symbol font named `upright`. Its spacing is less tight than in the text font.

```
\DeclareSymbolFont{upright}       {OT1}{zplm}{m}{n}
\DeclareSymbolFont{letters}       {OML}{zplm}{m}{it}
\DeclareSymbolFont{symbols}       {OMS}{zplm}{m}{n}
\DeclareSymbolFont{largesymbols}  {OMX}{zplm}{m}{n}

\SetSymbolFont{upright}{bold}     {OT1}{zplm}{b}{n}
\SetSymbolFont{letters}{bold}     {OML}{zplm}{b}{it}
\SetSymbolFont{symbols}{bold}     {OMS}{zplm}{b}{n}
\SetSymbolFont{largesymbols}{bold}{OMX}{zplm}{m}{n}

\DeclareMathAlphabet{\mathbf}     {OT1}{zplm}{b}{n}
\DeclareMathAlphabet{\mathbold}   {OML}{zplm}{b}{it}

\DeclareSymbolFontAlphabet{\mathrm}    {operators}
\DeclareSymbolFontAlphabet{\mathnormal}{letters}
\DeclareSymbolFontAlphabet{\mathcal}   {symbols}
```

The following symbols used to come from 'operators'; we take them from the 'upright' symbol font now:

```
\DeclareMathSymbol{!}{\mathclose}{upright}{"21}
\DeclareMathSymbol{+}{\mathbin}{upright}{"2B}
\DeclareMathSymbol{:}{\mathrel}{upright}{"3A}
% \DeclareMathSymbol{;}{\mathpunct}{operators}{"3B} % punctuation!
\DeclareMathSymbol{=}{\mathrel}{upright}{"3D}
\DeclareMathSymbol{?}{\mathclose}{upright}{"3F}
\DeclareMathDelimiter{(}{\mathopen} {upright}{"28}{largesymbols}{"00}
\DeclareMathDelimiter{)}{\mathclose}{upright}{"29}{largesymbols}{"01}
\DeclareMathDelimiter{[}{\mathopen} {upright}{"5B}{largesymbols}{"02}
\DeclareMathDelimiter{]}{\mathclose}{upright}{"5D}{largesymbols}{"03}
\DeclareMathDelimiter{/}{\mathord}{upright}{"2F}{largesymbols}{"0E}
% \DeclareMathSymbol{\colon}{\mathpunct}{operators}{"3A} % punctuation!
\DeclareMathAccent{\acute}{\mathalpha}{upright}{"13}
\DeclareMathAccent{\grave}{\mathalpha}{upright}{"12}
\DeclareMathAccent{\ddot}{\mathalpha}{upright}{"7F}
\DeclareMathAccent{\tilde}{\mathalpha}{upright}{"7E}
\DeclareMathAccent{\bar}{\mathalpha}{upright}{"16}
\DeclareMathAccent{\breve}{\mathalpha}{upright}{"15}
\DeclareMathAccent{\check}{\mathalpha}{upright}{"14}
\DeclareMathAccent{\hat}{\mathalpha}{upright}{"5E}
\DeclareMathAccent{\dot}{\mathalpha}{upright}{"5F}
\DeclareMathAccent{\mathring}{\mathalpha}{upright}{"17}
\DeclareMathSymbol{\mathdollar}{\mathord}{upright}{"24}
```

As to uppercase Greek, see below!

The follwowing symbols used to come from 'letters'. Now they are taken from 'operators', with respect to correct spacing of decimal numbers:

```
\DeclareMathSymbol{,}{\mathpunct}{operators}{44}
\DeclareMathSymbol{.}{\mathord}{operators}{46}
```

Use Pazo as (partial) \mathbb font:

```
\ifpazo@BB
  \AtBeginDocument{%
  \let\mathbb\relax
  \DeclareMathAlphabet\PazoBB{U}{fplmbb}{m}{n}
  \newcommand{\mathbb}{\PazoBB}
  }
\fi
```

Reduce the space around math operators:

```
%\thinmuskip=2.5mu
\medmuskip=3.5mu plus 1mu minus 1mu
%\thickmuskip=4.5mu plus 1.5mu minus 1mu
```

Compensate for increased letter spacing:

```
\def\joinrel{\mathrel{\mkern-3.45mu}}
```

Make \hbar work with Palatino:

```
\renewcommand{\hbar}{{\mkern0.8mu\mathchar'26\mkern-6.8muh}}
```

Optionally use slanted greek capitals:

```
\ifpazo@slGreek
  \DeclareMathSymbol{\Gamma}  {\mathalpha}{letters}{"00}
  \DeclareMathSymbol{\Delta}  {\mathalpha}{letters}{"01}
  \DeclareMathSymbol{\Theta}  {\mathalpha}{letters}{"02}
  \DeclareMathSymbol{\Lambda} {\mathalpha}{letters}{"03}
  \DeclareMathSymbol{\Xi}     {\mathalpha}{letters}{"04}
  \DeclareMathSymbol{\Pi}     {\mathalpha}{letters}{"05}
  \DeclareMathSymbol{\Sigma}  {\mathalpha}{letters}{"06}
  \DeclareMathSymbol{\Upsilon}{\mathalpha}{letters}{"07}
  \DeclareMathSymbol{\Phi}    {\mathalpha}{letters}{"08}
  \DeclareMathSymbol{\Psi}    {\mathalpha}{letters}{"09}
  \DeclareMathSymbol{\Omega}  {\mathalpha}{letters}{"0A}
\else
  \DeclareMathSymbol{\Gamma}{\mathalpha}{upright}{"00}
  \DeclareMathSymbol{\Delta}{\mathalpha}{upright}{"01}
  \DeclareMathSymbol{\Theta}{\mathalpha}{upright}{"02}
  \DeclareMathSymbol{\Lambda}{\mathalpha}{upright}{"03}
  \DeclareMathSymbol{\Xi}{\mathalpha}{upright}{"04}
  \DeclareMathSymbol{\Pi}{\mathalpha}{upright}{"05}
  \DeclareMathSymbol{\Sigma}{\mathalpha}{upright}{"06}
  \DeclareMathSymbol{\Upsilon}{\mathalpha}{upright}{"07}
  \DeclareMathSymbol{\Phi}{\mathalpha}{upright}{"08}
  \DeclareMathSymbol{\Psi}{\mathalpha}{upright}{"09}
  \DeclareMathSymbol{\Omega}{\mathalpha}{upright}{"0A}
\fi
```

These symbols should always be upright:

```
\DeclareMathSymbol{\upGamma}{\mathord}{upright}{0}
\DeclareMathSymbol{\upDelta}{\mathord}{upright}{1}
\DeclareMathSymbol{\upTheta}{\mathord}{upright}{2}
\DeclareMathSymbol{\upLambda}{\mathord}{upright}{3}
\DeclareMathSymbol{\upXi}{\mathord}{upright}{4}
\DeclareMathSymbol{\upPi}{\mathord}{upright}{5}
\DeclareMathSymbol{\upSigma}{\mathord}{upright}{6}
\DeclareMathSymbol{\upUpsilon}{\mathord}{upright}{7}
\DeclareMathSymbol{\upPhi}{\mathord}{upright}{8}
\DeclareMathSymbol{\upPsi}{\mathord}{upright}{9}
\DeclareMathSymbol{\upOmega}{\mathord}{upright}{10}
```

Make \mathbold act on lowercase greek too

```
\DeclareMathSymbol{\alpha}{\mathalpha}{letters}{"0B}
\DeclareMathSymbol{\beta}{\mathalpha}{letters}{"0C}
\DeclareMathSymbol{\gamma}{\mathalpha}{letters}{"0D}
\DeclareMathSymbol{\delta}{\mathalpha}{letters}{"0E}
\DeclareMathSymbol{\epsilon}{\mathalpha}{letters}{"0F}
\DeclareMathSymbol{\zeta}{\mathalpha}{letters}{"10}
\DeclareMathSymbol{\eta}{\mathalpha}{letters}{"11}
\DeclareMathSymbol{\theta}{\mathalpha}{letters}{"12}
\DeclareMathSymbol{\iota}{\mathalpha}{letters}{"13}
\DeclareMathSymbol{\kappa}{\mathalpha}{letters}{"14}
\DeclareMathSymbol{\lambda}{\mathalpha}{letters}{"15}
\DeclareMathSymbol{\mu}{\mathalpha}{letters}{"16}
\DeclareMathSymbol{\nu}{\mathalpha}{letters}{"17}
\DeclareMathSymbol{\xi}{\mathalpha}{letters}{"18}
\DeclareMathSymbol{\pi}{\mathalpha}{letters}{"19}
\DeclareMathSymbol{\rho}{\mathalpha}{letters}{"1A}
\DeclareMathSymbol{\sigma}{\mathalpha}{letters}{"1B}
\DeclareMathSymbol{\tau}{\mathalpha}{letters}{"1C}
\DeclareMathSymbol{\upsilon}{\mathalpha}{letters}{"1D}
\DeclareMathSymbol{\phi}{\mathalpha}{letters}{"1E}
\DeclareMathSymbol{\chi}{\mathalpha}{letters}{"1F}
\DeclareMathSymbol{\psi}{\mathalpha}{letters}{"20}
\DeclareMathSymbol{\omega}{\mathalpha}{letters}{"21}
\DeclareMathSymbol{\varepsilon}{\mathalpha}{letters}{"22}
\DeclareMathSymbol{\vartheta}{\mathalpha}{letters}{"23}
\DeclareMathSymbol{\varpi}{\mathalpha}{letters}{"24}
\DeclareMathSymbol{\varrho}{\mathalpha}{letters}{"25}
\DeclareMathSymbol{\varsigma}{\mathalpha}{letters}{"26}
\DeclareMathSymbol{\varphi}{\mathalpha}{letters}{"27}
```

Finally, we save our new definition of \hbar and defer some code until \begin{document}:

```
\let\s@vedhbar\hbar
\AtBeginDocument{%
```

Ensure proper scaling of the AMS fonts, even when not used through the amssymb or amsfonts packages:

```
  \DeclareFontFamily{U}{msa}{}%
  \DeclareFontShape{U}{msa}{m}{n}{<->s*[1.042]msam10}{}%
  \DeclareFontFamily{U}{msb}{}%
  \DeclareFontShape{U}{msb}{m}{n}{<->s*[1.042]msbm10}{}%
  \DeclareFontFamily{U}{euf}{}%
  \DeclareFontShape{U}{euf}{m}{n}{<-6>eufm5<6-8>eufm7<8->eufm10}{}%
  \DeclareFontShape{U}{euf}{b}{n}{<-6>eufb5<6-8>eufb7<8->eufb10}{}%
```

In case the amsfonts package is loaded additionally, we must restore our \hbar:

```
  \@ifpackageloaded{amsfonts}{\let\hbar\s@vedhbar}{}
```

Take care of \big & friends working with scaled math extension font, unless amsmath.sty is also loaded:

```
  \@ifpackageloaded{amsmath}{}{%
  \newdimen\big@size
  \addto@hook\every@math@size{\setbox\z@\vbox{\hbox{$($}\kern\z@}%
   \global\big@size 1.2\ht\z@}
  \def\bBigg@#1#2{%
   {\hbox{$\left#2\vcenter to#1\big@size{}\right.\n@space$}}}
  \def\big{\bBigg@\@ne}
  \def\Big{\bBigg@{1.5}}
  \def\bigg{\bBigg@\tw@}
  \def\Bigg{\bBigg@{2.5}}
  }
}
```

We redefine the default sizes for super and subscripts. Palatino, like most other type 1 fonts, is scaled linearly, so the default ratios (0.7 and 0.5) may produce unreadably small characters.

```
\def\defaultscriptratio{.76}
\def\defaultscriptscriptratio{.6}
```

These default ratios are not used for any sizes that have been explicitly declared, so we redeclare the sizes used by the standard classes. At least for the lower sizes this is important as we don't want to end up with a 5pt font being reduced even further.

```
\DeclareMathSizes{5}    {5}    {5}    {5}
\DeclareMathSizes{6}    {6}    {5}    {5}
\DeclareMathSizes{7}    {7}    {5}    {5}
\DeclareMathSizes{8}    {8}    {6}    {5}
\DeclareMathSizes{9}    {9}    {7}    {5}
\DeclareMathSizes{10}   {10}   {7.6}  {6}
\DeclareMathSizes{10.95}{10.95}{8}    {6}
\DeclareMathSizes{12}   {12}   {9}    {7}
\DeclareMathSizes{14.4} {14.4} {10}   {8}
\DeclareMathSizes{17.28}{17.28}{12}   {10}
\DeclareMathSizes{20.74}{20.74}{14.4} {12}
\DeclareMathSizes{24.88}{24.88}{20.74}{14.4}
```

Restore font info:

```
\let\@font@info\s@ved@info
```

⟨/mathpazo⟩

Credits

The Pazo fonts and the related virtual fonts were created by Diego Puga. The mathpazo package was written by D. Puga and W. Schmidt.