The txgreeks package

Jean-François Burnol

jfbu (at) free (dot) fr

Abstract

The TX Fonts of Young Ryu provide a very complete replacement for the default math fonts of \TeX{} and \LaTeX{}, containing all CM symbols and even all symbols from the AMS fonts, and more. In particular upright shapes for the Greek letters are available (they are necessary in French mathematical typography). The txgreeks package allows \LaTeX{} users who use the TX fonts to easily select the shapes (italic or upright) for the Greek lowercase and uppercase letters. This is compatible with using arbitrary text fonts in the document.

1 Features

The shape of the Greek letters is decided according to the options passed to the package: TeX (=sloped, the default: lowercase italic and uppercase upright), \texttt{upright} (=French=upgreek, lowercase and uppercase upright), ISO (=itgreek, lowercase and uppercase italic), \texttt{itGreek} (italic uppercase) and \texttt{upGreek} (upright uppercase). Use both of \texttt{itGreek} and \texttt{upgreek} to get lowercase upright and uppercase italic.

The uppercase Greek letters are not taken from the TX roman font \texttt{txr} (‘operators’) but from either the alternate math italic font \texttt{txmia} (‘lettersA’, which in fact provides upright Greek in OML encoding), or from the math italic font \texttt{txmi} (‘letters’, where uppercase Greek is in italic shape). This means that if some other package redefines the ‘operators’ font used in math (presumably to coincide with the ‘roman’ font used for the document text), this will have no impact on the Greek uppercase letters. If some package modifies the ‘letters’ font used in math (which typically is the font for Latin letters and lowercase Greek letters, and with txgreeks is also used for the italic uppercase Greek letters), then of course the glyphs will be from the new font. But the upright glyphs will still be from the TX Font \texttt{txmia} (‘lettersA’).

Following the model of the fourier package, the alternative shape of the Greek letters is accessible via the \texttt{\other...} prefix: \texttt{\otheralpha} will be upright if \texttt{\alpha} is italic, and vice versa. For the lowercase Greek letters there are also the macros ending in \texttt{up} (\texttt{\alphapla}, ... ) which are already defined by \texttt{txfonts}.

Regarding the uppercase letters, the package defines (replacing the amsmath definitions) \texttt{\varGamma}, etc... as synonyms for \texttt{\otherGamma}, etc..., but does not define additional macros \texttt{\Gammaup} as this was not done by the package \texttt{txfonts}. Use rather \texttt{\otherGamma} if necessary.

The package defines \texttt{\omicron}, \texttt{\otheromicron}, and \texttt{\omicronup}. But there is no upright omicron in the \texttt{txmia} font, so we have to use the construct \texttt{\mathrm{\omicron}} (this will a priori use the TX roman font \texttt{txr}).

\footnotesize
\begin{itemize}
\item [1]package \url{http://mirrors.ctan.org/help/Catalogue/entries/txfonts.html}
\item [2]This document describes \texttt{txgreeks} version 1.0 (2011/03/16).
\item [3]contrarily to amsmath we define the \texttt{\varGamma}, etc... to be of type \texttt{\mathalpha} so they obey, like the default \texttt{\Gamma}, \texttt{\Gamma}, etc... the math alphabet changing commands; however to access the bold glyphs I recommend using either the \texttt{\bm} command from the \texttt{bm} package or the \texttt{\boldsymbol} command from the \texttt{amsbsy} package and not \texttt{\mathbf} which by default will use the TX roman font \texttt{txr}.
\end{itemize}
It is not necessary to write \usepackage{txfonts} prior to \usepackage{txgreeks} as this is done by txgreeks itself, but for clarity of the \LaTeX\ source of the document to be typeset, this is highly recommended, as txgreeks does very minor things compared to txfonts.

Using txgreeks should be hopefully compatible with any package which is already compatible with txfonts.

## 2 Implementation

\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{txgreeks}[2011/03/16 v1.0 shape selection for the TX fonts Greek letters]
\RequirePackage{txfonts}
\newif\iftgs@uplower
\newif\iftgs@itupper
\def\tgs@Greek@sh{0}
\DeclareOption{itgreek}{\tgs@uplowerfalse\tgs@ituppertrue}
\DeclareOption{upgreek}{\tgs@uplowertrue\tgs@itupperfalse}
\DeclareOption{itGreek}{\def\tgs@Greek@sh{1}}
\DeclareOption{upGreek}{\def\tgs@Greek@sh{2}}
\DeclareOption{TeX}{\tgs@uplowerfalse\tgs@itupperfalse} %default
\DeclareOption{sloped}{\ExecuteOptions{TeX}}
\DeclareOption{upright}{\ExecuteOptions{upgreek}}
\DeclareOption{French}{\ExecuteOptions{upright}}
\DeclareOption{ISO}{\ExecuteOptions{itgreek}}
\DeclareOption*{\PackageWarning{txgreeks}{Unknown option '\CurrentOption'}}
\ProcessOptions\relax
\ifcase\tgs@Greek@sh\or\tgs@ituppertrue\or\tgs@itupperfalse\fi

\re@DeclareMathSymbol\varGamma etc... defined in amsmath, but with type \mathord
\re@DeclareMathSymbol\varGamma\textalpha\{letters\}{0}
\re@DeclareMathSymbol\varDelta\textalpha\{letters\}{1}
\re@DeclareMathSymbol\varTheta\textalpha\{letters\}{2}
\re@DeclareMathSymbol\varLambda\textalpha\{letters\}{3}
\re@DeclareMathSymbol\varXi\textalpha\{letters\}{4}
\re@DeclareMathSymbol\varPi\textalpha\{letters\}{5}
\re@DeclareMathSymbol\varSigma\textalpha\{letters\}{6}
\re@DeclareMathSymbol\varUpsilon\textalpha\{letters\}{7}
\re@DeclareMathSymbol\varPhi\textalpha\{letters\}{8}
\re@DeclareMathSymbol\varPsi\textalpha\{letters\}{9}
\re@DeclareMathSymbol\varOmega\textalpha\{letters\}{10}

\re@DeclareMathSymbol\mathGamma\textalpha\{letters\}{0}
\re@DeclareMathSymbol\mathDelta\textalpha\{letters\}{1}
\re@DeclareMathSymbol\mathTheta\textalpha\{letters\}{2}
\re@DeclareMathSymbol\mathLambda\textalpha\{letters\}{3}
\re@DeclareMathSymbol\mathXi\textalpha\{letters\}{4}
\re@DeclareMathSymbol\mathPi\textalpha\{letters\}{5}
\re@DeclareMathSymbol\mathSigma\textalpha\{letters\}{6}
\re@DeclareMathSymbol\mathUpsilon\textalpha\{letters\}{7}
\re@DeclareMathSymbol\mathPhi\textalpha\{letters\}{8}
\re@DeclareMathSymbol\mathPsi\textalpha\{letters\}{9}
\re@DeclareMathSymbol\mathOmega\textalpha\{letters\}{10}

\re@DeclareMathSymbol{\varPsi}{\mathalpha}{letters}{9}
\re@DeclareMathSymbol{\varOmega}{\mathalpha}{letters}{10}
\re@DeclareMathSymbol{\omicron}{\mathalpha}{letters}{'o}

Unfortunately no upright omicron in letters\alpha = \text{txmia}
\let\omicronup\undefined
\newcommand{\omicronup}{\mathrm{o}}
\ifg@uplower % Upright lowercase Greek letters
\let\otheralpha\alpha
\let\otherbeta\beta
\let\othergamma\gamma
\let\otherdelta\delta
\let\otherepsilon\epsilon
\let\otherzeta\zeta
\let\othereta\eta
\let\othertheta\theta
\let\otheriota\iota
\let\otherkappa\kappa
\let\otherlambda\lambda
\let\othermu\mu
\let\othernu\nu
\let\otherxi\xi
\let\otherpi\pi
\let\otherrho\rho
\let\othersigma\sigma
\let\othertau\tau
\let\otherupsilon\upsilon
\let\otherphi\phi
\let\otherchi\chi
\let\otheromicron\omicron
\let\alpha\alphaup
\let\beta\betaup
\let\gamma\gammaup
\let\delta\deltaup
\let\epsilon\epsilonup
\let\zeta\zetap\up
\let\eta\etaup
\let\theta\thetaup
\let\iota\iotaup
\let\kappa\kappaup
\let\lambda\lambdaup
\let\mu\muup
\let\nu\nuup
\let\xi\xipiup
\let\pi\piup
\let\rho\rhoup

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