

UQGPF_Paper_RevTeX_PRD

Title: UQGPF_Paper_RevTeX_PRD

Body Instructions: Convert the prepared `uqgpf_paper_revtext.tex` (RevTeX4-2 style) into a compiled PDF, using the APS/PRD formatting so it looks ready for journal submission.

Note: The following is a very detailed, self-contained document describing the steps, settings, and considerations to convert and compile the LaTeX source into a production-ready APS PRD-style manuscript. It covers environment setup, file structure, dependencies, compilation commands, common issues, and best practices. It is written to be used as a standalone guide and as a companion to the actual TeX source file.

1. Document overview
2. Objective: Produce a properly formatted manuscript for Physical Review D (PRD) using RevTeX 4.2 with APS style conventions.
3. Target: Generate a single PDF document from `uqgpf_paper_revtext.tex` and associated files, suitable for journal submission or arXiv posting.
4. Scope: Includes preamble configuration, figure and table placement guidelines, bibliographic style, acronyms, math formatting, cross-references, and supplementary material guidelines as typically required by PRD.
5. Environment prerequisites
6. Operating system: Linux, macOS, or Windows (with LaTeX distribution).
7. TeX distribution: TeX Live 2023+ or MiKTeX (latest).
8. Required packages (should be installed automatically by TeX Live in most cases, but verify):
9. `revtex4-2.cls`
10. `amsmath`, `amssymb`
11. `graphicx`
12. `hyperref`
13. `cleveref`
14. `natbib` or `biblatex` (depending on the bibliography approach)
15. `bibtex` or `biber` (depending on bibliography backend)

16. siunitx
17. xcolor
18. url
19. booktabs
20. inputenc (UTF-8)
21. fontenc (T1)
22. microtype (optional but recommended)
23. unicode-math (if using XeLaTeX or LuaLaTeX; not typical for RevTeX; see below)
24. TeX engine considerations:
25. Primarily use pdflatex with RevTeX 4.2.
26. If using fonts or Unicode math features, XeLaTeX or LuaLaTeX can be configured, but ensure RevTeX compatibility.
27. For most PRD submissions, pdfLaTeX with RevTeX 4.2 and BibTeX is standard.
28. File structure (expected)
29. uqgpf_paper_revtext.tex
30. Main LaTeX file containing the document class, preamble, title/author/affiliations, abstract, sections, equations, figures, tables, acknowledgments, appendices, and references.
31. uqgpf_paper_revtext.bib
32. Bibliography database with references cited in the manuscript.
33. figures/
34. Directory containing figure image files (e.g., .pdf, .png, .eps depending on workflow and engine).
35. supplementary/
36. Directory for supplementary material (if any) such as additional figures, data, or code.
37. ensure that any external dependencies (custom macros, included graphics) are accessible relative to the root directory.
38. Preamble and document class configuration (RevTeX 4.2)
39. Document class:
40. \documentclass[aps,prd,reprint,onecolumn,groupedaddress,showpacs,superscriptaddress,nobibliography]{revtex4-2}

41. For submission, use:

- `\documentclass[aps,prd,preprint,superscriptaddress,showpacs,nofootinbib,longbibliography]{revtex4-2}`

42. For final two-column PRD-like appearance, use:

- `\documentclass[aps,prd,reprint,groupedaddress,showpacs,unsortedaddress]{revtex4-2}`

43. Package loading and options:

44. `\usepackage[T1]{fontenc}`

45. `\usepackage[utf8]{inputenc}` % In pdf_latex; if using XeLaTeX/LuaLaTeX, omit this and use fontspec

46. `\usepackage{amsmath,amssymb}`

47. `\usepackage{graphicx}`

48. `\usepackage{hyperref}`

49. `\usepackage{dcolumn}` % For alignment on decimal point in tables (if used)

50. `\usepackage{bm}`

51. `\usepackage{siunitx}`

52. `\usepackage{natbib}` % If the bib style is natbib-based

53. `\usepackage{booktabs}`

54. `\usepackage{hyperref}`

55. `\usepackage{cleveref}`

56. `\hypersetup{colorlinks=true,linkcolor=blue,citecolor=blue,urlcolor=cyan}`

57. Bibliography style:

58. PRD usually uses the APS-PRD style via BibTeX:

`\bibliographystyle{apsrev4-1}` or similar (exact style depends on RevTeX 4.2 compatibility). If using natbib with apsrev4-1, then citations appear with numbers or author-year depending on options.

59. For long bibliographies, consider `\bibliographystyle{apsrev4-2}` if available with RevTeX 4.2. If not, use `\bibliographystyle{apsrev4-1}`.

60. Special commands and macros (example placeholders; your `uqgpf_paper_revteX.tex` may define its own):

61. `\newcommand{\ud}{\,\mathrm{d}}`

62. `\newcommand{\abs}[1]{\left| \#1 \right|}`

63. `\newcommand{\Tr}{\mathrm{Tr}}`

64. `\newcommand{\strutbox}{\rule{0pt}{2.5ex}}` % for vertical spacing in tables

65. Ensure not to redefine essential math or RevTeX environments.

66. Title, authors, and affiliations

67. Use `\title{...}`, `\author{...}`, and `\affiliation{...}` or `\thanks{...}` as appropriate.
68. The RevTeX 4.2 class handles affiliations and footnotes for author emails with `\email{...}`.
69. For corresponding author, include `\email{corresponding@example.com}`.
70. For multiple authors, use `\author{First A. Last}\affiliation{Institution 1}`
`\author{Second B. Author}\affiliation{Institution 2}` and possibly
`\collaboration{The UQGPF Collaboration}` if applicable.
71. Abstract and keywords
72. The abstract is enclosed by `\begin{abstract} ... \end{abstract}`
73. PRD style can include `\pacs{...}` (older) or `\keywords{...}` depending on
RevTeX version and PRD policy. In RevTeX 4.2, PACS are optional; many
journals accept not including PACS.
74. If keywords are required, include `\keywords{keyword1, keyword2, ...}` after
the abstract or in a separate place depending on the template conventions.
75. Sectioning and structure
76. Follow conventional PRD structure:
77. Introduction
78. Theoretical framework or Model
79. Methods
80. Results
81. Discussion
82. Conclusions
83. Acknowledgments
84. Appendices (A, B, C, ...)
85. Use standard LaTeX sectioning commands: `\section`, `\subsection`,
`\subsubsection`, etc.
86. For equation labeling, use `\label{eq:...}` and refer with `\eqref{eq:...}`.
87. For figures and tables:
88. `\begin{figure}[t] \centering \includegraphics[width=\columnwidth]{figs/
figure_name} \caption{Descriptive caption.} \label{fig:example} \end{figure}`
89. `\begin{table}[t] \centering \begin{tabular}{lcc} \toprule Column 1 & Column
2 & Column 3 \\\midrule Data & Data & Data \\\bottomrule \end{tabular}`
`\caption{Table caption.} \label{tab:example} \end{table}`
90. For cross-references:

91. Use `\cref{fig:example}` for figures and `\ref{eq:example}` for equations when `cleveref` is loaded.
92. Superscripts and footnotes:
93. RevTeX handles affiliations with superscripts; use `\affiliation` and/or `\thanks` as appropriate.
94. Figures and graphics
95. Preferred formats for PRD submissions:
96. Vector graphics: PDF or EPS
97. Raster graphics: PNG or EPS (high resolution)
98. Use `\includegraphics` with width options, e.g., `width=\columnwidth` or `width=0.5\textwidth`.
99. If using subfigures, either rely on subcaption package or implement manually with `minipage`; RevTeX 4.2 is compatible with subcaption.
100. Ensure all figures have descriptive captions and are cited in the text.
101. Place figure files in a `figures/` directory and reference them as `figures/` filename.
102. Equations and math
103. Use `amsmath` environments:
104. `\begin{equation} ... \end{equation}`
105. `\begin{align} ... \end{align}`
106. Numbering with `\label{eq:number}`
107. Use `\mathcal{L}`, `\mathcal{H}`, etc. for Lagrangians, Hamiltonians.
108. Use proper units with `siunitx`:
109. `\SI{1}{\GeV}`
110. `\SI{-3}{\GeV}`
111. For displayed equations across lines, use `aligned` and `split` environments as needed.
112. Bibliography and citations
113. BibTeX workflow:
114. Run: `pdflatex uqgpf_paper_revtextex`
115. Run: `bibtex uqgpf_paper_revtextex`
116. Run: `pdflatex uqgpf_paper_revtextex`

117. Run: `pdflatex uqgpf_paper_revtext.tex`
118. Ensure the .bib file `uqgpf_paper_revtext.bib` contains all references with correct fields: author, title, journal, volume, page, year, doi, url, etc.
119. If using natbib:
120. `\bibliographystyle{apsrev4-2}`
121. `\bibliography{uqgpf_paper_revtext}`
122. If using biblatex:
123. `\usepackage{biblatex}`
124. `\addbibresource{uqgpf_paper_revtext.bib}`
125. `\printbibliography`
126. Note: RevTeX 4.2 by default uses BibTeX with apsrev4-1 style; biblatex requires additional setup and may not be standard for PRD submissions.
127. Verify that in-text citations render as numbers [1], [2], etc., or as author-year if configured; PRD generally uses numeric citations.
128. Appendices and supplementary material
129. Appendices go after the main text and before references (or as per PRD guidelines).
130. Use `\appendix` to switch to appendix mode, then `\section{Derivation of ...}`
131. For supplementary material, indicate availability and provide a separate section or a file in the supplementary/ folder as required by the journal.
132. Hyperlinks and metadata
133. Hyperref package is loaded to create clickable references in the PDF.
134. Ensure PDF metadata is set via `\hypersetup`:
135. `pdftitle={UQGPF_Paper_RevTeX_PRD}`
136. `pdfauthor={Author Names}`
137. `pdfsubject={Subject}`
138. `pdfkeywords={PRD, RevTeX, Quantum Fluid, UQGPF}`
139. Use `colorlinks true` and choose link colors that are readable; standard: blue for links, cyan for URLs.
140. Submission-ready considerations
141. Check for:
142. All references cited in the text appear in the bibliography and vice versa.

143. Figures and tables have captions and labels.
144. Equations referenced with `\eqref`.
145. No use of undefined macros; ensure all custom commands are defined.
146. No excessive use of explicit page breaks or line breaks; let the layout flow naturally.
147. Compliance with PRD page limits and file size constraints.
148. Generated PDF should be clean and portable; avoid embedded fonts that may cause issues.
149. Ensure arXiv compatibility if desired: avoid using non-standard engines or packages not supported by arXiv.
150. Example minimal template structure (illustrative)
151. This section provides a minimal but representative outline of `uqgpf_paper_revtext.tex`, showing typical content and commands. Replace placeholders with actual content from the prepared source.
152. Preamble:
153. `\documentclass[aps,prd,preprint,superscriptaddress,showpacs,nofootinbib]{revtex4-2}`
154. `\usepackage[T1]{fontenc}`
155. `\usepackage[utf8]{inputenc}`
156. `\usepackage{amsmath,amssymb}`
157. `\usepackage{graphicx}`
158. `\usepackage{bm}`
159. `\usepackage{siunitx}`
160. `\usepackage{hyperref}`
161. `\usepackage{cleveref}`
162. `\usepackage{booktabs}`
163. `\hypersetup{colorlinks=true,linkcolor=blue,citecolor=blue,urlcolor=cyan}`
164. `% Add any custom macros here`
165. `\begin{document}`
166. Title and authors:
167. `\preprint{PRD-PRERELEASE}`
168. `\title{UQGPF_Paper_RevTeX_PRD}`

169. `\author{First A. Last}`
170. `\affiliation{Institution A}`
171. `\author{Second B. Author}`
172. `\affiliation{Institution B}`
173. `\date{\today}`
174. `\begin{abstract}`
 - Abstract text summarizing the work.
 - `\end{abstract}`
175. `\maketitle`
176. Main body:
177. `\section{Introduction}`
178. `\section{Model and Methods}`
179. `\section{Results}`
180. `\section{Discussion}`
181. `\section{Conclusions}`
182. `\begin{acknowledgments}`
 - Acknowledgments text.
 - `\end{acknowledgments}`
183. `\appendix`
184. `\section{Derivation}`
185. `\end{document}`
186. Step-by-step compilation workflow
187. Place `uqgpf_paper_revtext.tex`, `uqgpf_paper_revtext.bib`, and figures in the project directory with the proper subfolders.
188. Open a terminal/command prompt.
189. Navigate to the project directory.
190. Run the compilation sequence:
191. `pdflatex uqgpf_paper_revtext.tex`
192. `bibtex uqgpf_paper_revtext`
193. `pdflatex uqgpf_paper_revtext.tex`
194. `pdflatex uqgpf_paper_revtext.tex`
195. Check for errors and warnings in the log outputs.
196. View the resulting PDF: `uqgpf_paper_revtext.pdf`

197. If references or citations are unresolved, run the sequence again until all are resolved.
198. If using color or hyperref, ensure cross-references are clickable in the generated PDF.
199. Troubleshooting common issues
200. Missing packages:
201. Install via TeX Live or MiKTeX package manager; update the package database and re-run compilation.
202. Undefined references:
203. Run the compilation sequence multiple times; ensure bibtex is invoked with the correct base name.
204. Figure not found:
205. Check the path in `\includegraphics`; use relative paths and ensure the file exists in the figures directory.
206. Font issues with UTF-8 characters:
207. Ensure input encoding matches the compiler; for pdf_latex, use `\usepackage[utf8]{inputenc}` and include fonts that support the characters.
208. Hyperref color conflicts:
209. If colors cause readability issues, adjust `\hypersetup` or disable colorlinks for submission if required.
210. Compliance with PRD formatting specifics
211. Paper length:
212. Ensure the manuscript adheres to PRD length guidance; adhere to page numbers and figure counts.
213. Figure placement:
214. RevTeX's default placeholders and floats will guide figure placement; adjust as needed to meet submission guidelines, possibly using `[t]`, `[b]`, `[h]`, or the float package if necessary.
215. Supplemental materials:
216. If required, provide a separate supplementary file or link; reference it in the manuscript with a sentence such as "See supplementary material for..."
217. Acknowledgments and funding:

218. Include all funding sources, grant numbers, and institutional support as appropriate for PRD submissions.
219. Final verification checklist
220. The PDF compiles without errors or warnings that affect content.
221. All figures and tables have captions and labels; all references cite properly.
222. The document adheres to RevTeX 4.2 formatting and PRD submission conventions.
223. The bibliography is complete and properly formatted.
224. The document is readable, and the math is properly typeset.
225. All acronyms are defined at first use; consider a glossary if many acronyms are used.
226. Follow-up actions
227. If you want, I can provide a tailored, step-by-step command script (bash or PowerShell) to automate the exact compilation sequence for your environment.
228. I can also generate a minimal example file set (uqgpf_paper_revteX.tex, uqgpf_paper_revteX.bib, and a placeholder figure) to demonstrate the final structure and formatting for PRD submission.
229. Additional notes
230. Ensure that any institutional or collaboration-specific requirements (e.g., author list order, collaboration name formatting, grant acknowledgment templates) are integrated into the author section and acknowledgments.
231. If the manuscript includes specialized fonts or nonstandard symbols, verify that they render correctly in the final PDF and are compliant with PRD guidelines.

End of document.