An Improved ANS Transaction Template

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INTRODUCTION

Microsoft Word can be a finicky beastie. LaTeX abstracts content from formatting, allowing the user to let a style file such as this take care of uppercasing the section headings, spacing the paragraphs, and shuffle around the figures.

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The S_N equations were developed by Carlson [1]. Another paper is cited here [2].

THEORY

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Equations look exceedingly pretty. Here is a 3-D, monoenergetic, steady-state transport equation with isotropic scattering and an isotropic extraneous source:

$$\begin{aligned}&\boldsymbol{\Omega}\cdot\boldsymbol{\nabla}\psi(\boldsymbol{x},\boldsymbol{\Omega}) + \sigma(\boldsymbol{x})\psi(\boldsymbol{x},\boldsymbol{\Omega}) \\ &\quad = \frac{\sigma_s(\boldsymbol{x})}{4\pi}\int_{4\pi}\psi(\boldsymbol{x},\boldsymbol{\Omega}')\,\mathrm{d}\Omega' + \frac{q(\boldsymbol{x})}{4\pi} \equiv \frac{1}{4\pi}Q(\boldsymbol{x})\,, \end{aligned} \tag{1a}$$

inside $\boldsymbol{x}\in V$, $\boldsymbol{\Omega}\in 4\pi$, with an incident boundary condition

$$\psi(\boldsymbol{x},\boldsymbol{\Omega}) = \psi^b(\boldsymbol{x},\boldsymbol{\Omega})\,,\quad \boldsymbol{x}\in\partial V,\ \boldsymbol{\Omega}\cdot\boldsymbol{n}<0\,. \tag{1b}$$

RESULTS AND ANALYSIS

The results were interesting, so interesting in fact that we have decided to present them here.

Subsection Goes Here

The user must manually capitalize initial letters of a subsection heading.

For those who like equations in their papers, LaTeX is a good choice. Here is an equation for the Marshak diffusion boundary condition:

$$4J^- = \phi + 2D\boldsymbol{n}\cdot\boldsymbol{\nabla}\phi\,. \tag{2}$$

If we so choose, we can effortlessly reference the equation later.

Another paragraph starts with Eq. (2) and sets J^- to zero, a vacuum boundary condition:

$$0 = \phi + \frac{2}{3}\frac{1}{\sigma}\boldsymbol{n}\cdot\boldsymbol{\nabla}\phi\,.$$

The extrapolation distance is $2/3$. A more detailed asymptotic analysis yields an extrapolation distance of about 0.71045.

Figure 1 shows how a plot might conceivably look in your document. Always place figures after they are referenced so as not to throw off the reader. You can use symbols and different line styles to help differentiate your results, especially if they are printed in black and white. Note how Fig. 1 uses dashed lines -- for the exact solution, solid lines - for the new method's solutions, and dotted lines : for existing inaccurate methods.

Later on, we can include a table, even one that spans two columns such as Table I. Notice how the table reference uses a Roman numeral for its numbering scheme, whereas the figure reference uses an Arabic numeral. For one-column tables, use the `table` environment; two-column tables use `table*`. The same applies to figures.

Another Subsection

Excessive sectioning in a three-page document is discouraged, but here are more subsections to demonstrate compliance with the ANS formatting guidelines.

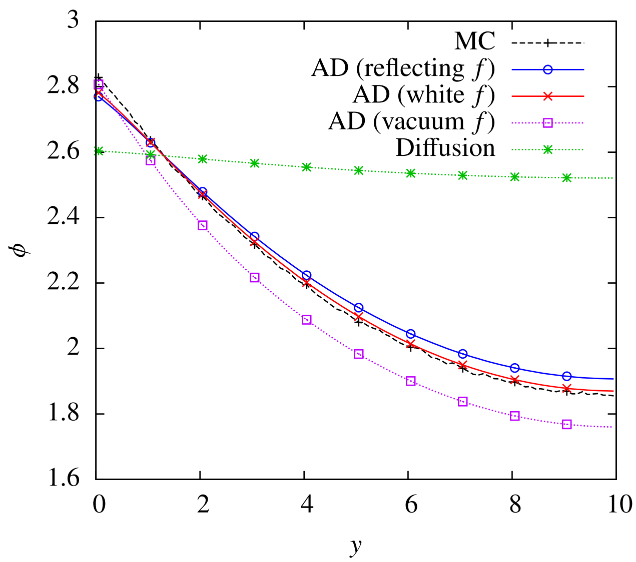

Fig. 1. Captions are flush with the left.

Third-level Heading

This subsubsection shows compliance with the ANS-specified standard. This level of heading should be used rarely.

Another Such Heading

And, if you really think you need a third-level heading, you should make sure that your subsection needs at least two of them.

CONCLUSIONS

The included ANS style file and this clear example file are a panacea for the hours of headache that invariably results from formatting a document in Microsoft Word.

APPENDIX

Numbering in the appendix is different:

$$2 + 2 = 5\,. \tag{A.1}$$

and another equation:

$$a + b = c\,. \tag{A.2}$$

ACKNOWLEDGMENTS

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REFERENCES

1. B. G. CARLSON, “Solution of the Transport Equation by S_n Approximations,” Tech. Rep. LA-1599, Los Alamos Scientific Laboratory (1953).
2. E. W. LARSEN and A. B. WOLLABER, “A Quantitative Theory of Angular Truncation Errors in Three-Dimensional S_N Calculations,” *Nuclear Science and Engineering*, **160**, 3, 267–283 (2008).

	$\phi_T(0)$	$\phi_T(10)$	$\phi_T(20)$	$\phi_D(0)$	$\phi_D(10)$	$\phi_D(20)$	ρ	ε	N_{it}
$c = 0.999$	0.9038	20.63	31.24	0.9087	20.63	31.23	0.2192	10^{-7}	15
$c = 0.990$	0.3675	13.04	24.7	0.3696	13.04	24.69	0.2184	10^{-7}	15
$c = 0.900$	0.009909	4.776	17.64	0.009984	4.786	17.63	0.2118	10^{-7}	14
$c = 0.500$	6.069×10^{-5}	2.212	15.53	6.213×10^{-5}	2.239	15.53	0.2068	10^{-7}	13

TABLE I. This is an example of a really wide table which might not normally fit in the document.