

# An Improved ANS Transaction Template<sup>1</sup>

Seth R. Johnson,\* Abraham Lincoln<sup>†</sup>

\*Radiation Transport Group, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN

<sup>†</sup>State Capitol Building, Springfield, IL  
sethrj@umich.edu, honestabe@example.com

## INTRODUCTION

Microsoft Word can be a finicky beastie.  $\text{\LaTeX}$  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:

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

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

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

## RESULTS AND ANALYSIS

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

<sup>1</sup>Notice: this manuscript is a work of fiction. Any resemblance to actual articles, living or dead, is purely coincidental.

## Subsection Goes Here

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

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

$$4J^- = \phi + 2D\mathbf{n} \cdot \nabla \phi. \quad (2)$$

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:

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

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.

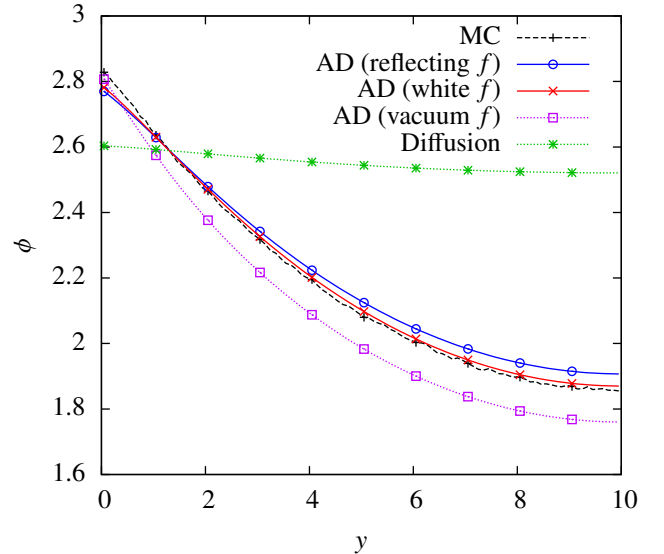


Fig. 1. Captions are flush with the left.

Later on, we can include a table, even one that spans two columns such as Table I. Notice how the table reference uses a

	$\phi_T(0)$	$\phi_T(10)$	$\phi_T(20)$	$\phi_D(0)$	$\phi_D(10)$	$\phi_D(20)$	$\rho$	$\varepsilon$	$N_{it}$
$c = 0.999$	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
$c = 0.500$	$6.069 \times 10^{-5}$	2.212	15.53	$6.213 \times 10^{-5}$	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.

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.

#### *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:

$$2 + 2 = 5. \quad (\text{A.1})$$

and another equation:

$$a + b = c. \quad (\text{A.2})$$

## 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).