Assessment for scientific writing

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The scientific writing course introduced the general IMRAD structure for scientific papers, and introduced basic skills on how to use Latex editing a scietific paper.

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I. INTRODUCTION

Question 2.1 Please give a brief introduction on the general structure of scientific papers here,i.e. the IMRAD structure [1]. What kind of content should be addressed in each part?

ANSWER:
"IMRaD" format refers to a paper that is structured by four main sections: Introduction, Methods, Results, and Discussion. This format is often used for lab reports as well as for reporting any planned, systematic research in the social sciences, natural sciences, or engineering and computer sciences.

1. **Introduction – Make a case for your research**
   The introduction explains why this research is important or necessary or important. Begin by describing the problem or situation that motivates the research. Move to discussing the current state of research in the field; then reveal a "gap" or problem in the field. Finally, explain how the present research is a solution to that problem or gap. If the study has hypotheses, they are presented at the end of the introduction.

2. **Methods – What did you do?**
   The methods section tells readers how you conducted your study. It includes information about your population, sample, methods, and equipment. The "gold standard" of the methods section is that it should enable readers to duplicate your study. Methods sections typically use subheadings; they are written in past tense, and they use a lot of passive voice. This is typically the least read section of an IMRaD report.

3. **Results – What did you find?**
   In this section, you present your findings. Typically, the Results section contains only the findings, not any explanation of or commentary on the findings (see below). Results sections are usually written in the past tense. Make sure all tables and figures are labeled and numbered separately. Captions go above tables and beneath figures.

4. **Discussion - What does it mean?**
   In this section, you summarize your main findings, comment on those findings (see below), and connect them to other research. You also discuss limitations of your study, and use these limitations as reasons to suggest additional, future research.

Question 2.2 Please list some Academic Misconduct/Academic Dishonesty.(you can answer this part in Chinese and insert a .jpg file of your answer.)

ANSWER:
Here are some common types of academic dishonesty,

1. **Plagiarism**
   One of the most common forms of academic dishonesty is plagiarism. The act of plagiarism occurs when you use someone else's work without citing it properly. If you're not mindful, this can be easy to do — especially when writing a paper or essay.

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You can avoid plagiarism by utilizing an appropriate style or citation guide. This typically includes using both in-text citations and references in your paper. Tools that can help students avoid plagiarism include style guides, such as the AP Style Guide or Chicago Manual of Style, and plagiarism detection software.

2. **Cheating**
   Cheating is another common form of academic dishonesty. It may consist of copying answers from a classmate, selling or buying an academic paper or assignment, or using unauthorized materials during a test.

II. EQUATIONS

Question 3 Please type Equations shown in output20251122.pdf file.

ANSWER:
The metric tensor reads

$$g_{\mu\nu} = \begin{pmatrix} 1-\vec{v}^{\,2} & -v_1 & -v_2 & -v_3 \\ -v_1 & -1 & 0 & 0 \\ -v_2 & 0 & -1 & 0 \\ -v_3 & 0 & 0 & -1 \end{pmatrix} \tag{1}$$

The detailed expressions for $N_\uparrow^+$, $N_\downarrow^+$, $N_\uparrow^-$, $N_\downarrow^-$ are listed as follows:

$$N_\uparrow^+ = \frac{1}{2\pi^2}\sum_{n=-\infty}^{\infty}\int dp_t dp_z p_t J_n(p_t r)^2 \frac{3\Phi\exp(-\frac{\epsilon_n-\mu}{T}) + 6\bar{\Phi}\exp(-2\frac{\epsilon_n-\mu}{T}) + 3\exp(-3\frac{\epsilon_n-\mu}{T})}{1+3\Phi\exp(-\frac{\epsilon_n-\mu}{T}) + 3\bar{\Phi}\exp(-2\frac{\epsilon_n-\mu}{T}) + \exp(-3\frac{\epsilon_n-\mu}{T})}, \tag{2}$$

$$N_\downarrow^+ = \frac{1}{2\pi^2}\sum_{n=-\infty}^{\infty}\int dp_t dp_z p_t J_{n+1}(p_t r)^2 \frac{3\Phi\exp(-\frac{\epsilon_n-\mu}{T}) + 6\bar{\Phi}\exp(-2\frac{\epsilon_n-\mu}{T}) + 3\exp(-3\frac{\epsilon_n-\mu}{T})}{1+3\Phi\exp(-\frac{\epsilon_n-\mu}{T}) + 3\bar{\Phi}\exp(-2\frac{\epsilon_n-\mu}{T}) + \exp(-3\frac{\epsilon_n-\mu}{T})}, \tag{3}$$

$$N_\uparrow^- = \frac{1}{2\pi^2}\sum_{n=-\infty}^{\infty}\int dp_t dp_z p_t J_n(p_t r)^2 \frac{-3\bar{\Phi}\exp(-\frac{\epsilon_n+\mu}{T}) - 6\Phi\exp(-2\frac{\epsilon_n+\mu}{T}) - 3\exp(-3\frac{\epsilon_n+\mu}{T})}{1+3\bar{\Phi}\exp(-\frac{\epsilon_n+\mu}{T}) + 3\Phi\exp(-2\frac{\epsilon_n+\mu}{T}) + \exp(-3\frac{\epsilon_n+\mu}{T})}, \tag{4}$$

$$N_\downarrow^- = \frac{1}{2\pi^2}\sum_{n=-\infty}^{\infty}\int dp_t dp_z p_t J_{n+1}(p_t r)^2 \frac{-3\bar{\Phi}\exp(-\frac{\epsilon_n+\mu}{T}) - 6\Phi\exp(-2\frac{\epsilon_n+\mu}{T}) - 3\exp(-3\frac{\epsilon_n+\mu}{T})}{1+3\bar{\Phi}\exp(-\frac{\epsilon_n+\mu}{T}) + 3\Phi\exp(-2\frac{\epsilon_n+\mu}{T}) + \exp(-3\frac{\epsilon_n+\mu}{T})}. \tag{5}$$

$$\Phi^\pm = \begin{pmatrix}
[\triangle_{uu}^{rr}]^\pm & 0 & 0 & 0 & [\triangle_{ud}^{rg}]^\pm & 0 & 0 & 0 & [\triangle_{us}^{rb}]^\pm \\
0 & 0 & 0 & [\triangle_{du}^{rg}]^\pm & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & [\triangle_{su}^{rb}]^\pm & 0 & 0 \\
0 & [\triangle_{du}^{rg}]^\pm & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
[\triangle_{ud}^{rg}]^\pm & 0 & 0 & 0 & [\triangle_{dd}^{gg}]^\pm & 0 & 0 & 0 & [\triangle_{ds}^{gb}]^\pm \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & [\triangle_{sd}^{gb}]^\pm & 0 \\
0 & 0 & [\triangle_{su}^{rb}]^\pm & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & [\triangle_{sd}^{gb}]^\pm & 0 & 0 & 0 \\
[\triangle_{us}^{rb}]^\pm & 0 & 0 & 0 & [\triangle_{ds}^{gb}]^\pm & 0 & 0 & 0 & [\triangle_{ss}^{bb}]^\pm
\end{pmatrix} \tag{6}$$

$$\begin{aligned} f_{n,p}^+(x) &\equiv e^{-i(\omega t - p_y y - p_z z)}\phi_n(x - p_y/|q_f|B), \quad (n=0,1,\ldots) \\ f_{n,p}^-(x) &\equiv e^{-i(\omega t - p_y y - p_z z)}\phi_{n-1}(x - p_y/|q_f|B), \quad (n=1,2,\ldots) \end{aligned} \tag{7}$$

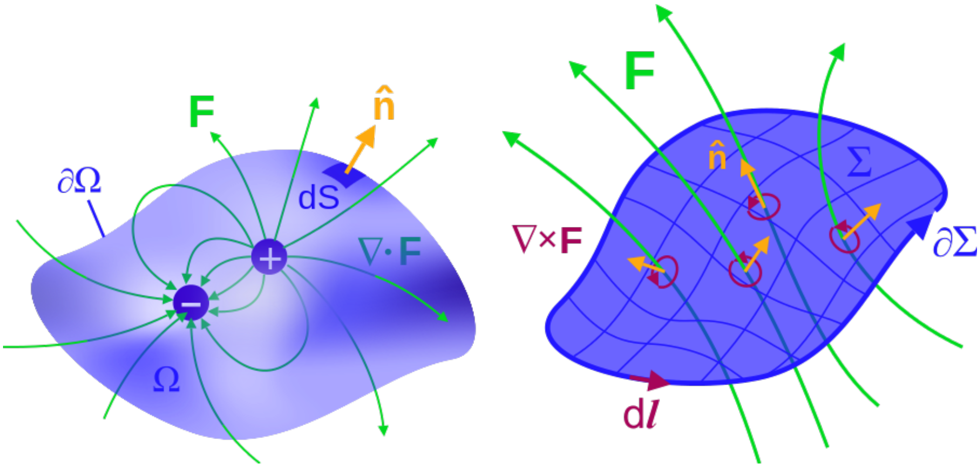
with new notation $\tilde{p_\parallel} = (\omega, 0, 0, p_z)$ and $\tilde{p_\perp} = \left(0, 0, -\sqrt{2n|q_f|B}, 0\right)$ introduced. After some simple calculations the dispersion relation reads

$$E_{f,n,s}^2 = \begin{cases} p_z^2 + \left(\sqrt{M^2 + 2n|q_f|B} - s\xi\right)^2, & n \geq 1. \\ p_z^2 + (M+\xi)^2, & n = 0. \end{cases} \tag{8}$$

Where $M = \sigma + m$ and $s = \pm 1$ correspond to different spin projections.

III. FIGURES

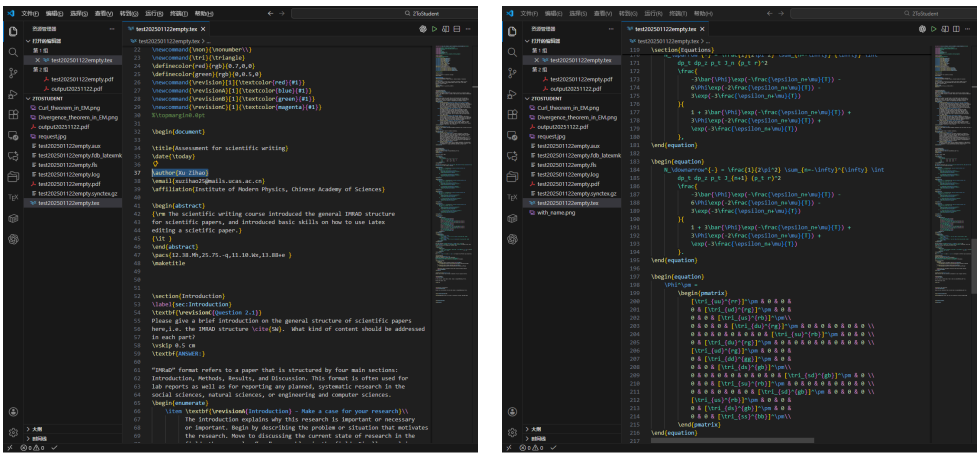
Question 4.1 Please use subfigure to insert two subfigures Divergence_theorem_in_EM.png and Curl_theorem_in_EM.png in attachment.



(a)The Gauss divergence theorem (b)The Kelvin-Stokes theorem

FIG. 1: The Gauss divergence throrem and the Kelvin-Stokes theorem

Question 4.2 please show at least two different screenshots of your original textfile.



(a).tex file with My Name (b).tex file with My Code

FIG. 2: .tex file with My Name and Code

IV. TABLES

Question 5 In this section, please make a Table shown in output20251122.pdf file.

Please make Table here.

		Model A				Model B			
		$N_{TC}=3$	$N_{TC}=4$	$N_{TC}=5$	$N_{TC}=6$	$N_{TC}=3$	$N_{TC}=4$	$N_{TC}=5$	$N_{TC}=6$
Input	$z_m^{-1}(TeV)$	1.072	1.079	1.083	1.088	0.299	0.299	0.299	0.299
	c	1.395	1.414	1.423	1.427	0.099	0.099	0.099	0.099
	M	0.553	0.541	0.534	0.529	0.380	0.329	0.295	0.288
Output	S	0.15(fixed)				0.721	0.888	1.034	1.120
	$T_*(GeV)$	356	358	360	362	100(fixed)			
	$m_{higgs}^{(1)}$	4.368	4.397	4.413	4.534	1.217	1.217	1.217	1.217
	$m_{techni-\rho}^{(0)}$	2.054	2.068	2.075	2.085	0.586	0.586	0.586	0.586
	$m_{techni-\rho}^{(1)}$	5.722	5.759	5.780	5.792	1.603	1.603	1.603	1.603
	$m_{II}^{(1)}$	5.531	5.521	5.515	5.502	3.135	2.686	2.385	2.185

TABLE I: Input parameters and output results from Model A and Model B, respectively. Note that the unit of particle mass is TeV.

V. LIST 10 REFERENCES

Question 6 Please list 10 references from [2]-[10] shown in output20251122.pdf file.

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