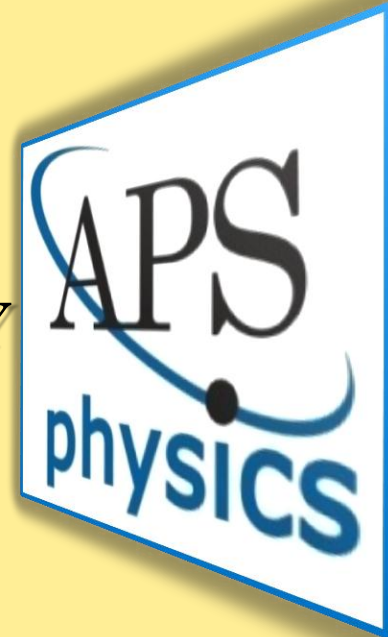


WRITING SUCCESSFUL MANUSCRIPTS
FOR PHYSICAL REVIEW LETTERS

Saad E. Hebboul *

The American Physical Society, Ridge, NY



PART 2 of 2

* Email: hebboul@aps.org

OUTLINE : PART 2 of 2



⑥ INACCESSIBLE TEST MANUSCRIPT 1 : LM1

⑦ ACCESSIBLE TEST MANUSCRIPT 2 : LM2

⑧ TEST QUESTIONS & PROBLEMS

TEST MANUSCRIPT 1 : LM1

Select a **LETTER** in your field, published after 1990,
with 3 overlapping characteristics :

⊙ **DIFFICULT TO READ**

⊙ **HARD TO GRASP RESULT**

⊙ **LESS SURPRISING RESULT**

➔ LM1 = INACCESSIBLE MANUSCRIPT

TEST MANUSCRIPT 1 : LM1

Study the contents of test manuscript LM1 in each of 3 overlapping categories :

- ◎ ABBREVIATIONS & TERMINOLOGY**
- ◎ INTRODUCTION & CONCLUSION**
- ◎ FIVE LEVELS OF THE LAYERED STRUCTURE**

TEST MANUSCRIPT 1 : LM1

Study the contents of test manuscript LM1 in each of the 5 levels of the layered structure:

◎ FIVE LEVELS OF THE LAYERED STRUCTURE

① TITLE

② ABSTRACT

③ IN THIS LETTER

④ FIGURES & EQUATIONS

⑤ MAIN TEXT

➡ ANSWER TEST QUESTIONS FOR LM1

OUTLINE : PART 2 of 2

⑥ INACCESSIBLE TEST MANUSCRIPT 1 : LM1

 ⑦ ACCESSIBLE TEST MANUSCRIPT 2 : LM2

⑧ TEST QUESTIONS & PROBLEMS

TEST MANUSCRIPT 2 : LM2

Select a **LETTER** in your field, published after 1990,
with 3 overlapping characteristics :

◎ **SIMPLE TO READ**

◎ **EASY TO GRASP RESULT**

◎ **MORE SURPRISING RESULT**

➡ LM2 = ACCESSIBLE MANUSCRIPT

TEST MANUSCRIPT 2 : LM2

Study the contents of test manuscript LM2 in each of 3 overlapping categories :

- ◎ ABBREVIATIONS & TERMINOLOGY**
- ◎ INTRODUCTION & CONCLUSION**
- ◎ FIVE LEVELS OF THE LAYERED STRUCTURE**

TEST MANUSCRIPT 2 : LM2

Study the contents of test manuscript LM2 in each of the 5 levels of the layered structure:

① FIVE LEVELS OF THE LAYERED STRUCTURE

① TITLE

② ABSTRACT

③ IN THIS LETTER

④ FIGURES & EQUATIONS

⑤ MAIN TEXT

➔ ANSWER TEST QUESTIONS FOR LM2

OUTLINE : PART 2 of 2

⑥ INACCESSIBLE TEST MANUSCRIPT 1 : LM1

⑦ ACCESSIBLE TEST MANUSCRIPT 2 : LM2

⑧ TEST QUESTIONS & PROBLEMS



TEST QUESTIONS & PROBLEMS : LM1 vs. LM2

Grade the contents of each test manuscript using a 200 – point scale divided among 4 problem sets:

◎ ABBREVIATIONS & TERMINOLOGY TESTS [20 points]

◎ INTRODUCTION & CONCLUSION TESTS [40 points]

◎ SELF – SIMILARITY TEST [100 points]

◎ WORD CLOUD TEST [40 points]

➡ MAXIMUM SCORE = 200 POINTS / MANUSCRIPT

ABBREVIATIONS & TERMINOLOGY TESTS

[20 points]

① ABBREVIATIONS :

[10 points]

Count the number “ N ” of different types of abbreviations that appear in the test manuscript. Do not keep track of how often each abbreviation is mentioned in the text.

Example abbreviations include AFM, STM, DFT, ARPES, BCS, QD, SWCNT, SDW, among others. Do not count international standards, e.g., chemical compound formulas, units, and math symbols.

Award points “ P ” according to the following formula:

*$P = 10 - (2 * N)$, for $N \leq 5$, and $P = 0$, for $N > 5$.*

Example: $P = 6$ points for $N = 2$.

ABBREVIATIONS & TERMINOLOGY TESTS

[20 points]

② AUTHOR-NAME TERMINOLOGY :

[10 points]

Count the number “ N ” of different author-name terminologies that appear in the test manuscript. Do not keep track of how often each terminology is mentioned in the text.

Example author-name terminologies include the “ Faraday Effect ” and the “ Bardeen-Cooper-Schrieffer Theory ”. Do not count international standards, e.g., Newton, Coulomb, and Tesla units.

Award points “ P ” according to the following formula:

*$P = 10 - (2 * N)$, for $N \leq 5$, and $P = 0$, for $N > 5$.*

Example: $P = 2$ points for $N = 4$.

INTRODUCTION & CONCLUSION TESTS

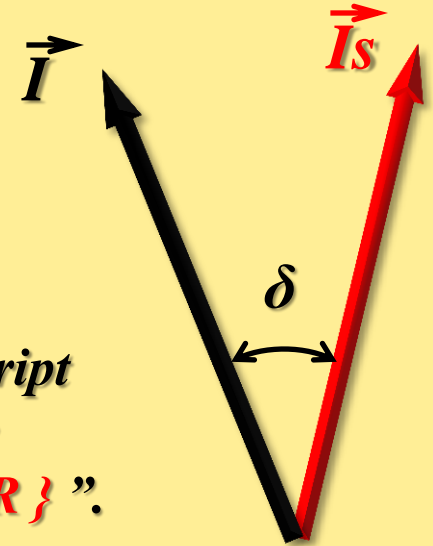
[40 points]

① INTRODUCTION :

[30 points]

Estimate the deviation angle “ δ ” between the manuscript introduction “ \vec{I} ” and an ideal story-line introduction :

“ $\vec{I}_s \equiv \{ \text{SURVEY, MOTIVATION, IN THIS LETTER} \}$ ”.



SURVEY : Explains the central issue of the work in the context of prior worldwide research accomplishments in the field.

MOTIVATION : Identifies the missing link between old & new results.

IN THIS LETTER : Presents the new result in relation to previous work.

Award points “ P ” according to the following scheme:

$P = 30, 15, \text{ or } 0$ points for $\delta = \text{Small, Medium, or Large angles.}$

Example: $P = 0$ points for a missing **SURVEY** in the introduction.

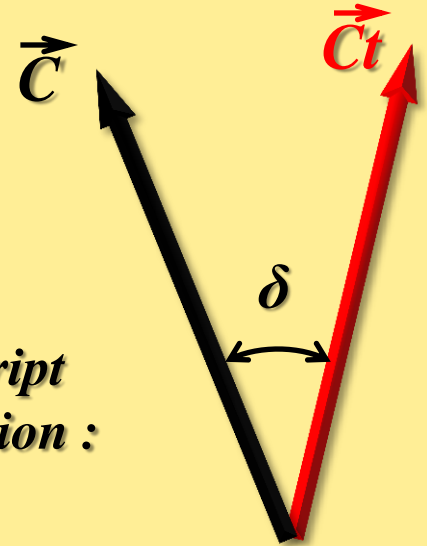
INTRODUCTION & CONCLUSION TESTS

[40 points]

② CONCLUSION :

[10 points]

Estimate the deviation angle “ δ ” between the manuscript conclusion “ \vec{C} ” and an ideal Tree-Model-type conclusion : “ $\vec{C}_t \equiv \{ \text{Future BRANCHES, IMPACT, FRUITS} \}$ ”.



Future BRANCHES : Which neighboring fields will be affected by the new result ? Will the new result generate new fields ?

Future IMPACT : What impact will the new result have on these fields ?

Future FRUITS : Will the new result give new basic or applied results ?

Award points “ P ” according to the following scheme:

$P = 10, 5, \text{ or } 0$ points for $\delta = \text{Small, Medium, or Large angles.}$

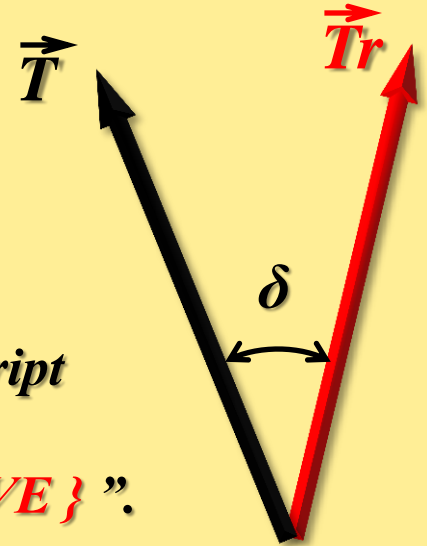
Example: $P = 0$ points for summarizing or rewriting the **ABSTRACT.**

SELF – SIMILARITY TEST

[100 points]

① TITLE :
[5 points]

Estimate the deviation angle “ δ ” between the manuscript title “ \vec{T} ” and an ideal specific result-oriented title :
“ $\vec{T}_r \equiv \{ \text{ACCURATE, ACCESSIBLE, INFORMATIVE} \}$ ”.



ACCURATE : Represents the new experimental and/or theoretical result accurately. Contains physical/chemical system(s) with the new result.

ACCESSIBLE : Avoids jargon, new terminology, & language problems.

INFORMATIVE : Invokes a clear new result or idea in the reader’s mind.

Award points “ P ” according to the following scheme:

$P = 5, 3, \text{ or } 0$ points for $\delta = \text{Small, Medium, or Large angles}$.

Example: $P = 0$ points for “Transport properties of superconductors”.

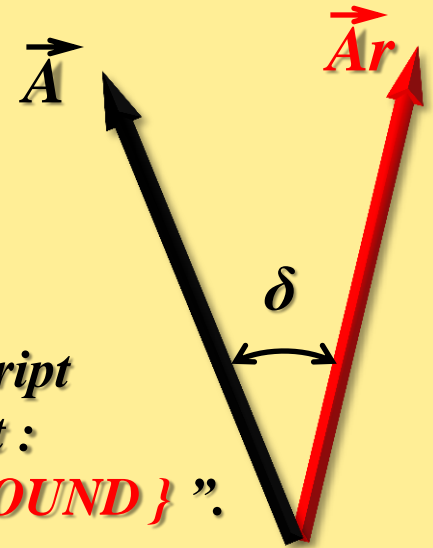
SELF – SIMILARITY TEST

[100 points]

② ABSTRACT :

[10 points]

Estimate the deviation angle “ δ ” between the manuscript abstract “ \vec{A} ” and an ideal result-summarizing abstract :
“ $\vec{Ar} \equiv \{ \text{ACCURATE, ACCESSIBLE, No-BACKGROUND} \}$ ”.



ACCURATE : Summarizes the new experimental and/or theoretical result accurately. Contains method(s) and means for obtaining the new result.

ACCESSIBLE : Avoids jargon, new terminology, & language problems.

No-BACKGROUND : Avoids introductory material including references.

Award points “ P ” according to the following scheme:

$P = 10, 5, \text{ or } 0$ points for $\delta = \text{Small, Medium, or Large angles.}$

Example: $P = 0$ points for abstract with historical account and/or jargon.

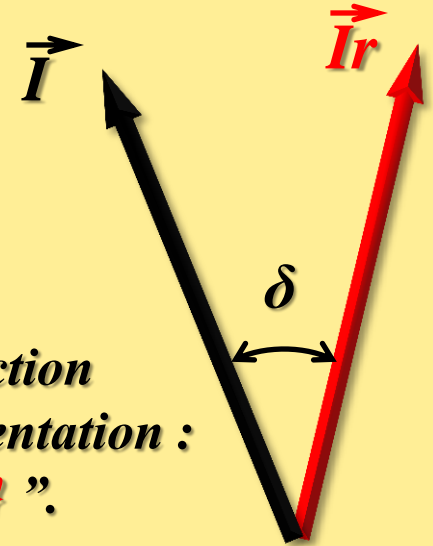
SELF – SIMILARITY TEST

[100 points]

③ IN THIS LETTER :

[15 points]

Estimate the deviation angle “ δ ” between the introduction ending “ \vec{I} ” and an ideal “In This Letter” result presentation : “ $\vec{I}_r \equiv \{ \text{COMPLETE, DETAILED, FULL - STORY} \}$ ”.



COMPLETE : Presents the new experimental and/or theoretical result in its entirety. Contains specific method(s) for obtaining the new result.

DETAILED : Gives enough detail for new method(s) and technique(s).

FULL - STORY : Ends the introduction with a “ punch-line ” effect.

Award points “ P ” according to the following scheme:

P = 15, 10, or 5 points for δ = Small, Medium, or Large angles.

Example: P = 5 points for “ In this Letter, we solve this old problem. ”.

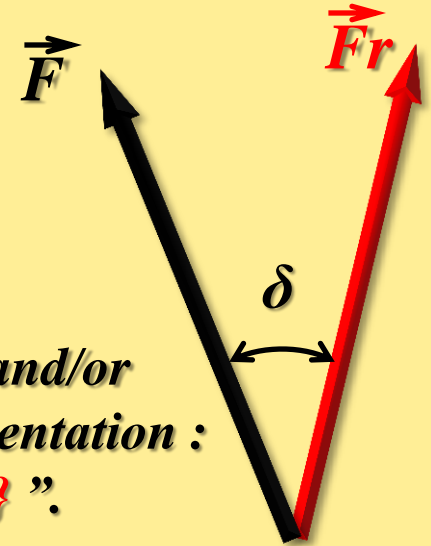
SELF – SIMILARITY TEST

[100 points]

④ FIGURES & EQUATIONS :

[30 points]

Estimate the deviation angle “ δ ” between the figures and/or equations “ \vec{F} ” and an ideal graphical/symbolic representation : “ $\vec{F}_r \equiv \{ \text{SETUP, DATA, EQUATIONS, ANALYSIS} \}$ ”.



SETUP : Defines the full physical/chemical/biological system(s) studied.
DATA : Shows raw measurements, data, and/or model assumptions.
EQUATIONS : Derives the essential symbolic formulation for the model.
ANALYSIS : Adds physical significance to raw data and/or calculations.

Award points “ P ” according to the following scheme:

$P = 30, 15, \text{ or } 5$ points for $\delta = \text{Small, Medium, or Large angles.}$

Example: $P = 15$ points for data-plot figures without a SETUP in Fig.1.

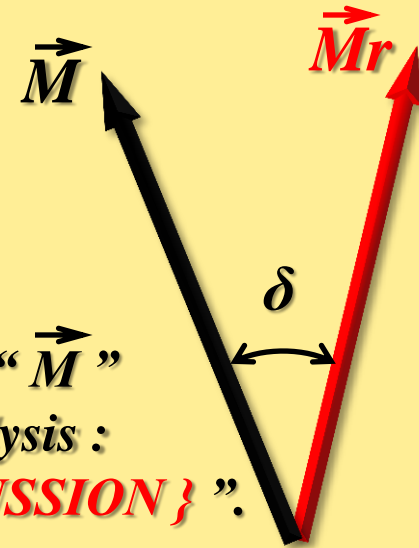
SELF – SIMILARITY TEST

[100 points]

⑤ MAIN TEXT :

[40 points]

Estimate the deviation angle “ δ ” between the main text “ \vec{M} ” and an ideal technical presentation of the result and analysis : “ $\vec{M}_r \equiv \{ \text{EXPERIMENT, THEORY, RESULT, DISCUSSION} \}$ ”.



EXPERIMENT : Describes the full experimental setup and techniques.
THEORY : Describes the full theoretical idea and model assumptions.
RESULT : Presents the entire result in enough detail for others to verify.
DISCUSSION : Analyzes the result. Reveals its strengths and limitations.

Award points “ P ” according to the following scheme:

$P = 40, 20, \text{ or } 10$ points for $\delta = \text{Small, Medium, or Large angles.}$

Example: $P = 20$ points for **NO** description of how the result is obtained.

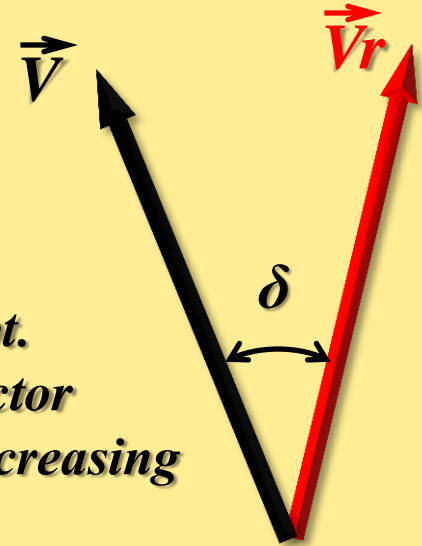
WORD CLOUD TEST

[40 points]

① MOST FREQUENT VERBS :

[20 points]

Record the five most frequent verbs in the test manuscript. These are the largest verbs in the word cloud. Form a vector “ \vec{V} ” whose components are the five verbs in order of decreasing size or frequency.



*Estimate the deviation angle “ δ ” between the verb vector “ \vec{V} ” of the test manuscript and an ideal strong verb vector for important results :
“ $\vec{V}_r \equiv \{ \text{FIND, SHOW, DEMONSTRATE, DISCOVER, PREDICT} \}$ ”.*

*Award points “ P ” according to the following scheme:
 $P = 20, 10, \text{ or } 5$ points for $\delta = \text{Small, Medium, or Large angles.}$*

*Example: $P = 5$ points for the following vector of weak-Letter verbs :
“ $\vec{V} \equiv \{ \text{STUDY, INVESTIGATE, SEARCH, VERIFY, REVISIT} \}$ ”.*

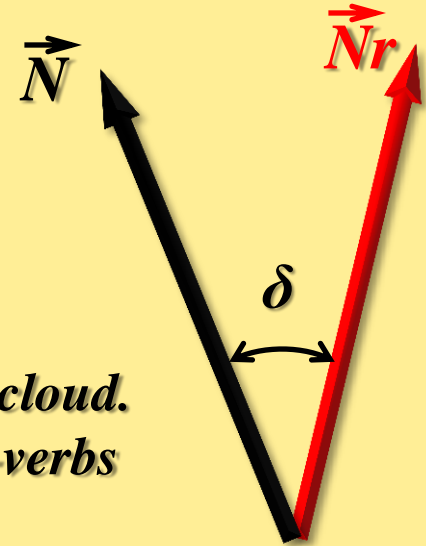
WORD CLOUD TEST

[40 points]

② MOST FREQUENT NON - VERBS :

[20 points]

Record the five most frequent non-verb words in the test manuscript. These are the largest non-verbs in the word cloud. Form a vector “ \vec{N} ” whose components are the five non-verbs in order of decreasing size or frequency.



*Estimate the deviation angle “ δ ” between the non-verb vector “ \vec{N} ” of the test manuscript and one possible non-verb vector for important results :
“ $\vec{N}_r \equiv \{ \text{RESULT, EVIDENCE, SOLUTION, DATA, PEAK} \}$ ”.*

Award points “ P ” according to the following scheme:

$P = 20, 10, \text{ or } 5$ points for $\delta = \text{Small, Medium, or Large angles.}$

Example: $P = 5$ points for the following vector of specialized non-verbs :
“ $\vec{N} \equiv \{ \text{CONTROL, AMPLIFIER, dB, CODE, } dI/dV \}$ ”.

CONCLUSIONS : *PART 2 of 2*

⑥ INACCESSIBLE TEST MANUSCRIPT 1 : LM1

Tends to score LOW on the 200 – point test.

Will likely have LOW impact on neighboring fields.

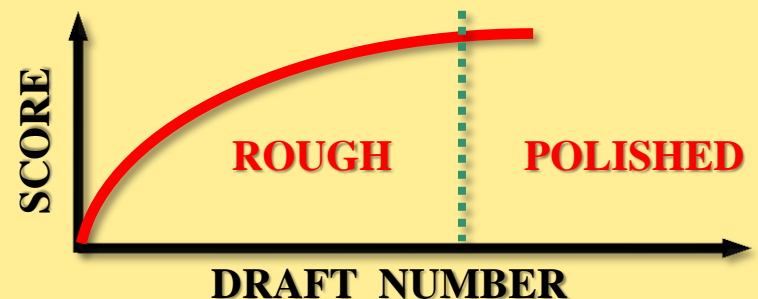
⑦ ACCESSIBLE TEST MANUSCRIPT 2 : LM2

Tends to score HIGH on the 200 – point test.

Will likely have HIGH impact on neighboring fields.

⑧ TEST QUESTIONS & PROBLEMS :

The 200 – point test can identify the transition from ROUGH drafts to POLISHED manuscripts.



ADDITIONAL PROBLEMS

[Extra Credit]

The next 3 problems ask you to enter your proposed revisions in the text-file versions of test manuscripts LM1 and LM2.

- ① *Can you expand all word abbreviations & acronyms in LM1 and LM2 without increasing the length of the affected sentences ?
Hint : Draw a path diagram for the sentence. Identify and remove all secondary ideas in side branches. Create a concise version of the sentence that preserves the central meaning without abbreviations.*
- ② *Can you find suitable scientific phrases as substitutes for all effects that are named after their discoverers in both LM1 and LM2 ?
A suitable phrase should be no more than 4 words long.
Example : “ Faraday Effect ” \implies “ Magneto-optical Effect ”*
- ③ *Can you rework the introductions of LM1 and LM2 so that their survey, motivation, and In-this-Letter parts are clearly separated in 3 consecutive paragraphs ? Can you improve the conclusions of LM1 and LM2 if they fail to go beyond a summary of results ?*

DOWNLOADING TEXT – FILE LETTERS

FOR WORD – CLOUD TESTS

- ① Access the selected published Letter online at the PRL website.**
- ② From the web browser, e.g., Firefox, click on “Save Page As”, then save the Letter as an “Adobe Acrobat Document”.**
- ③ Open the saved file in “Adobe Reader” by double-clicking on the filename.**
- ④ From “Adobe Reader”, click on “File”, then “Save As”, then “Text”.**
- ⑤ Save a text version of the Letter in a text file. Make sure the spacing between successive words is not lost in the conversion.**
- ⑥ Remove all formatting symbols and delete the reference list. Keep all equations, math symbols, and other text symbols.**

DISCLAIMER

The material in this workshop is meant to help authors write “successful” manuscripts that are accessible to a broad readership. While a “successful” manuscript might make a better case for a Letter, there is no guarantee that PRL will accept it. The relative merit of each manuscript is based on the validity, importance, and broad interest of the reported result. This workshop is primarily aimed at improving the presentation which plays a key role.

Aside from the list of 100 specialized terminologies, no other part of this workshop is obtained from existing manuscripts. Any similarity with published Letters or reviewed manuscripts is pure coincidence. Do not copy text from edited Letters in your own manuscripts.