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| Book Name: | [Current Research Progress in Physical Science](https://www.bookpi.org/bookstore/product/current-research-progress-in-physical-science-vol-1/) |
| Manuscript Number: | **Ms\_BPR\_4601** |
| Title of the Manuscript: | **Shot-noise-limited optical polarimetry with spin-alignment and magnetism decoupling** |
| Type of the Article | **BOOK CHAPTER** |

# Special note:

**A research paper already published in a journal can be published as a Book Chapter in an expanded form with proper copyright approval.**

**Source Article:**

**This chapter is an extended version of the article published by the same author(s) in the following journal. Results in Physics, Volume 65, October 2024, 107960.**

[**https://doi.org/10.1016/j.rinp.2024.107960**](https://doi.org/10.1016/j.rinp.2024.107960)

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| **PART 1: Comments** |
|  | **Reviewer’s comment****Artificial Intelligence (AI) generated or assisted review comments are strictly prohibited during peer review.** | **Author’s Feedback** *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.** | Here, the cross disciplinary approach has been taken where ideas of quantum mechanics, magnetism and classical optics (polarization) have been punched. Probing of multipole moments of atom by the impingement of linearly polarized probelight on the metal with variation of magnetic field (both spatially and temporally) has been implemented where background noise reduction is mostly challenging. One of the important ces of the result is controlling uncertainties of the quantal outcome maintaining the standard quantum limit. Moreover difference between spin orientation and spin alignment has been shown from the perspective of the effects of magnetic variation. The concept of decoupling of multipole moments abd magnetic fields on the basis of sweeping responses has been shown, along with the remanent projection has been also important. Finally, off resonance pictographdepicted by the response curve (Fig.8) where one may find weak signal (dead zone) is also a wonderful work. |  |
| **Is the title of the article suitable?****(If not please suggest an alternative title)** | Yes, but the following one could has been better-“Technique as well as limit (under control) of noise reduction in optical polaririmetry with spin- alignment abd optical sweeping” |  |
| **Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.** | **Yes, the abstract of the article is comprehensive.****Everything is okay. The main essence has been given in a nutshell. The main response curve dead zone could have been in one/two words.** |  |
| **Is the manuscript scientifically, correct? Please write here.** | The abstract has been precise and to the point. The introduction contains the key words- ‘QND, SQL, polarization, off-sesonance probe,polarization, perturbation, coupling, photon-shot noise’ which have been repeated and recurred alover the paper. Then came the section principle which showed the tensors corresponding to multipole moments of polarization. This portion gave subtle equations for better reproducibility. The orientation-based polarization -rotation and its relation with frequency and multipole moments of polarization tensors are catered. The description of experimental set up is quite sharp and sound. The Results and discussions part is well divided by three sub-sections with corresponding sub-headings. The conclusion section is also complete andComprehensive. |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.****-** | As I have seen plentiful references have been given and many of them have been from 2020 to 2024. |  |
| **Is the language/English quality of the article suitable for scholarly communications?** | From the linguistic point of view, the paper is simple, plain as well as enriched. Here I found two simple careless mistakes- one is ‘larmour’ has been speeled as ‘lamar’ and ‘peaks’ has been spelled as ‘peeks’ |  |
| **Optional/General** comments | N.A. |  |

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| **PART 2:** |
|  | **Reviewer’s comment** | **Author’s comment** *(if agreed with the reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Are there ethical issues in this manuscript?** | *Yes, The delaration of competing interest also reveals.* |  |

 **Reviewer details:**

 **Subhajit Samaddar, India**