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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\_4379** |
| Title of the Manuscript: | **Intermittent-Contact Heterodyne Force Microscopy** |
| 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.**

**Journal of Nanomaterials, Volume 2009, Article ID 762016, 2009.**

**Available:** [**https://doi.org/10.1155/2009/762016**](https://doi.org/10.1155/2009/762016)

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| PART 1: Comments | | |
|  | Reviewer’s comment | 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.** | **This manuscript presents Intermittent-Contact Heterodyne Force Microscopy (IC-HFM), an advanced AFM technique enhancing force sensitivity and phase detection. Utilizing the mechanical-diode effect and beat frequency generation, IC-HFM improves nanoscale material characterization. Its applications span nanomechanics, surface interactions, and material property mapping, benefiting fields like biophysics, semiconductors, and polymer science. By overcoming the limitations of traditional AFM methods, this study significantly advances high-precision nanoscale imaging, contributing to cutting-edge developments in material science and nanotechnology.** |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | **Yes** |  |
| 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** |  |
| **Is the manuscript scientifically, correct? Please write here.** | **Yes** |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.**  **-** | **Required more recent references** |  |
| Is the language/English quality of the article suitable for scholarly communications? | Improvement required |  |
| Optional/General comments | I have recognized the efforts the Authors have put into this “Intermittent-Contact Heterodyne Force Microscopy” work and the submitted manuscript is OK for ‘Accept’ after improvement as pointwise  1. Theoretical Clarity: The explanation of the mechanical-diode effect in intermittent contact needs improvement. The role of beat frequencies in enhancing phase sensitivity should be better justified with a mathematical model.  2. Experimental Setup: The rationale behind selecting ultrasonic frequencies (e.g., 4.800 MHz, 4.449 MHz) is unclear. More details on lock-in detection, signal-to-noise ratio, and tip-sample interaction forces are needed.  3. Comparison with Existing Methods: The study lacks a direct comparison with standard AFM techniques like Amplitude Modulation AFM or Contact Resonance AFM. A comparative table would help clarify its advantages.  4. Potential Applications: The paper should discuss how IC-HFM can be used for biological samples, polymer viscoelasticity studies, or semiconductor characterization. This would strengthen its impact.  5. Data Analysis: Figures lack statistical validation. The reproducibility of measurements and variations in resonance frequencies should be addressed. Quantitative phase shift analysis should be added.  6. Presentation & Style: Ensure consistent terminology, simplify complex sentences, and improve figure labels with proper scaling and units. More recent references should be cited.  The study is promising but requires revisions for theoretical depth, experimental clarity, and comparative analysis. Addressing these points will enhance its scientific impact. |  |

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| **PART 2:** | | |
|  | **Reviewer’s comment** | **Author’s comment** *(if agreed with 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?** | *(If yes, Kindly please write down the ethical issues here in details)* |  |

**Reviewer details:**

**Hari Shankar Biswas, Surendranath College, India**