IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 3, March 2024

Design and Development of Feedback Controller for Scanning Probe Microscopy Applications

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Abstract: *The Scanning Probe Microscopy (SPM) techniques, mainly Scanning tunneling microscopy (STM) and atomic force microscopy (AFM) instruments have great important in surface science laboratories due to its high potential to achieve image at atomic scale resolution. SPM has revolutionized our ability to explore the nanoscale world enabling the imaging, manipulation and characterization of materials at the atomic and molecular level. The experimental designing and its analysis of feedback network system has proposed for scanning tunneling microscopy. Instability in feedback network could affect the measurements and accuracy in surface topology of material. Feedback network circuit controls the necessary arrangementfor proper functioning of STM. It Controls the STM operation like a regulator circuit in sealing fan even if input voltage changes, the output has controlled by the regulator. The working of each element of feedback network is well discussed and analysed. The interconnection between the different elements of feedback control network is analysed with mathematical equations.STM has the outstanding advantage from the biological perspective of allowing measurements has made with a resolution of nanometers in aqueous media. Hence, living cells, working enzyme systems etc. can be examined.[4] SEM also investigates 'Trichomes' which is present on both surfaces of leaf. [5].*

Keywords: Scanning Probe Microscopy

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