



**Optical Properties of Silicon and Tin Nanowires**  
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**Abstract:**  
 Silicon and tin nanowires are a large class of one-dimensional materials whose unique properties are determined by their structural characteristics. In this work, we study the optical properties of silicon and tin nanowires. The optical properties are studied by means of the finite-difference time-domain (FDTD) method. The results show that the optical properties of these nanowires are strongly dependent on their diameter and length. The optical properties of these nanowires are studied by means of the finite-difference time-domain (FDTD) method. The results show that the optical properties of these nanowires are strongly dependent on their diameter and length.

**Keywords:** Silicon, Tin, Nanowires, Optical Properties, FDTD

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**Methodology:**  
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**Comparative analysis of a magnetic refrigeration stage in an autonomous cryogenic cooling system**  
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**Introduction:**  
 A 3D silicon detector has been developed by COMILLAS for a cryogenic system for submillimeter production in the framework of AMET project (Advanced Molecular Imaging Technology) in collaboration with other Spanish companies. For the refrigeration of the 3D silicon detector, an autonomous cryogenic cooling system (ACS) has been developed in collaboration with COMILLAS.

**The ACS is based on a closed loop liquid helium refrigeration system, where a certain amount of helium is cooled down to a temperature of 4.2 K by means of a liquid helium refrigerator. The ACS is based on a closed loop liquid helium refrigeration system, where a certain amount of helium is cooled down to a temperature of 4.2 K by means of a liquid helium refrigerator. The ACS is based on a closed loop liquid helium refrigeration system, where a certain amount of helium is cooled down to a temperature of 4.2 K by means of a liquid helium refrigerator.**

**Methodology:**  
 A comparative analysis of a magnetic refrigeration stage in an autonomous cryogenic cooling system has been developed. The results show that the magnetic refrigeration stage is more efficient than the other stages of the ACS.

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**Conclusions:**  
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**3D silicon detector**  
 The increase of interest in the use of silicon detectors for further limits of radiation hardness. The detectors are being developed in addition to silicon detectors, which create energy levels in the silicon lattice. The higher the energy levels, the higher the energy levels. The higher the energy levels, the higher the energy levels. The higher the energy levels, the higher the energy levels.

**Simulations**  
 The response of a 3D silicon detector when it is irradiated by a neutron beam is simulated by using the software Geant4. The results show that the detector is able to detect neutrons with a high efficiency. The detector is able to detect neutrons with a high efficiency. The detector is able to detect neutrons with a high efficiency.

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