



### REVIEWER'S REPORT

**Manuscript No.:** IJAR-55139

**Title:** TERAHERTZ TECHNOLOGY: CURRENT ADVANCES AND FUTURE PROSPECTS.

**Recommendation:**

- Accept as it is .....
- Accept after minor revision.....**
- Accept after major revision .....
- Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality	✓			
Techn. Quality		✓		
Clarity		✓		
Significance	✓			

**Reviewer Name:** Mr. Bilal Mir

### Reviewer's Comment for Publication.

This review article presents a broad and comprehensive overview of terahertz (THz) technology, covering its generation mechanisms, detection techniques, applications, challenges, and future prospects. The manuscript demonstrates a commendable effort in summarizing recent advancements and compiling an extensive reference list.

### Strengths

**1. Comprehensive Coverage:**

The article covers a wide range of THz generation and detection technologies including optical rectification, photoconductive antennas, QCLs, FELs, THz-TDS, and laser-plasma interactions.

**2. Well-structured Applications Section:**

The discussions on spectroscopy, medical diagnostics, security applications, and material characterization are informative and well-cited.

**3. Relevance and Significance:**

The manuscript highlights both current capabilities and future technological opportunities, making it valuable for researchers entering the field.

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### 4. Extensive References:

The reference list includes high-quality, peer-reviewed sources from journals such as *Nature Communications*, *Applied Physics Letters*, and *IEEE Transactions*.

## Areas Requiring Minor Revision

Although the manuscript is scientifically rich, several issues need attention before publication:

### 1. Language and Grammar

- There are numerous grammatical errors, typos, and inconsistent sentence structures.
- Examples include:
  - “this area of the spectrum has distinctive properties...” (line 8) — needs clarity
  - “whwn Plasma gets in interaction...” — spelling and readability issues
  - Repetitions and misplaced punctuation in Abstract and Introduction.

A thorough proofreading is necessary.

### 2. Formatting Issues

- Headings and numbering are inconsistent (e.g., “2.3.Quantum-cascade”, “2.4.Free-electron lasers”, repeated numbers, missing spaces).
- Figure references (Fig. 1, Fig. 2) appear as placeholders with no corresponding images.
- Table or illustrative diagrams should be included or removed if not available.

### 3. Lack of Critical Analysis

- Although descriptive, the review could benefit from a deeper critical comparison of technologies.
- For example, contrasting advantages/limitations of QCLs vs PCAs vs FELs would add scientific value.

### 4. Redundancy

- Some information is repeated in multiple sections (e.g., THz imaging applications appear in both the medical and security sections unnecessarily).

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### 5. Reference Formatting

- Several references are inconsistent in format and numbering (reference 22 appears twice).
- Some DOIs appear mismatched with journal entries.

Standardization is necessary.

### 6. Missing Discussion on Recent Breakthroughs

- The manuscript can be strengthened by including:
  - 6G/7G terahertz communication developments
  - Graphene-based THz modulators
  - Recent metamaterial-enabled THz devices
  - Standards and regulatory developments

### Overall Assessment

The manuscript is well-researched and contains a wealth of information relevant to current THz research. With **improved organization, language corrections, and reference formatting**, this review can make a strong contribution to the field. Therefore, I recommend **Accept After Minor Revision**.