Spectrum

Uma aplicação python voltada para detecção de por THz-TDS (TeraHertz Time-Domain Spectroscopy)

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Brief Introduction

THz-TDS (TeraHertz Time Domain Spectroscopy)

Newton-Raphson Method

Informations

$$ (n,k) \to T_c \to T_m \to \delta \to \text{new} (n,k) $$ Before proceding we assume first the default units to be used as follows

Dimension	Unit
Time	pico-seconds (ps)
Frequency	Tera-hertz (THz)

The main classes are

The input is data is as follows $$ [d] = \mu m \ [\nu] = THz $$

Input Files

Sample File

```
0,000    0,008
0,083    0,015
0,167    0,005
0,250    -0,004
0,333    -0,002
0,417    0,004
```

```
0,500    -0,008
0,583    0,010
0,666    0,004
0,750    -0,010
0,833    0,006
0,916    0,012
1,000    0,001
1,083    -0,012
1,166    0,012
1,250    0,005
...      ...
```

Json File

The json file follows with material

```json
{
    "material": {
        "name": "material",                  // Material's name
        "thickness": 200,                    // Sample thickness
        "sample": "sample.txt",              // File with sample data
        "reference": "reference.txt",        // File with reference data
        "time_step": 0.083,                  // Time step value
        "initial_refractive_index": [1,0]    // Initial guess refractive
index
    },
    "configurations": {
        "max_num_of_iterations": 10
    }
}
```

References