# "Table-Top Tunable Chiral Photonic Emitter" (https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.133.113804) –code package (MATLAB light code)–

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September 11, 2024

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## 2 Introduction

This code serves as the numerical package for the publication: "Table-Top Tunable Chiral Photonic Emitter" `https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.133.113804`, where details related to the underlying physics can be found in the supplementary material. The path of the files is indicated by ".../...", and the variables are referred to by variable. All the numbers are in SI units.

This code is written in MATLAB. It is developed to describe the semi-infinite Weyl semimetal (WSM) current response. It is valid for:

1. analysing currents along $x, y, z$ dimensions
2. WSM, Dirac semimetals, and 2D semimetals such as graphene
3. input driving fields at both IR and THz frequency ranges

## 3 Configure the code

The code should work by directly downloading and running on your local computer. To customize the code, please follow the steps below.

**Define constants:** physical constants can be defined by structure C under the path `my_struct/CONS.m`.

**Define input electric field:** input driving electric field can be defined by structure E under the path `my_struct/Field.m`.

**Numerical method:** everything related to the nonlinear current calculation is inside the structure M under the path `my_struct/@WSM/`

**Change the input wavelength:** switching from the IR driving pulse to THz driving pulse is achieved by enable/disable the following paragraph of codes in "main.m"

```
%------------------------
%optical pulse parameter
%------------------------
% C.lambda=1000e-9;
% C.tau=10e-15;
% E0=2e8;
%------------------------
%thz pulse parameter
%------------------------
C.lambda=10*1000e-9;
C.tau=40e-15;
E0=2e7;
```

# 4 Run and save the data

If you run directly after download, by opening the "main.m" and clicking run in MATLAB, the code should work without error. The output files will be automatically saved inside the folder `/my_output`. With the default configuration, the running time on a standard PC is around 6 minutes. The default outputs are the figures below.

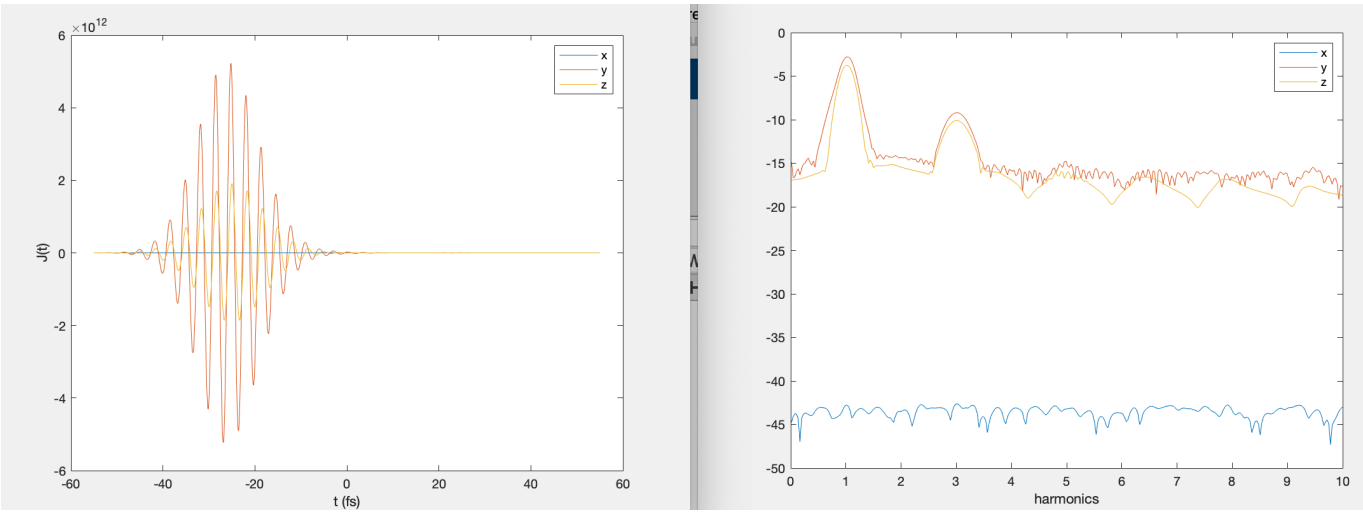


Figure 1: Left: current in the time domain. Right: corresponding current in the frequency domain i.e. Fourier transform of the left.

**Enjoy life and happy coding ♡.** Any questions please address to `lu.wangTHz@outlook.com`