FETA: FROMAGE Element Tracker and Animator

Documentation

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1 Introduction

FETA is an extension to FROMAGE, that can be used to graphically visualize the position and masse of each element used in the simulation for both the mirror and and the rotor. FETA is written using Python (tested using version `3.10`), and requires the libraries `os`, `numpy` and `matplotlib` (`.pyplot` and `.animation`).

2 Installation

The python file (`feta.py`) can be placed in the same directory as FROMAGE. It is recommended to create a new directory (by default, `./out/`) where FROMAGE output files can be reached.

3 Configuration

Fist, FROMAGE has to run and save its output in multiple files. The configuration file used has to contain :

```
SAVE_ROTOR ./out/rotor
SAVE_MIRROR ./out/mirror.txt
SAVE_DISPLACEMENT ./out/disp.txt
```

where `./out/` is the name of the output directory, and :

- `rotor_N.txt` is the name of the file describing the `N`-th rotor position ;
- `mirror.txt` is the name of the file describing the mirror position ;
- `disp.txt` is the name of the file describing the displacement of the mirror.

The names can be changed, but it has to be specified in `feta.py` :

```
# Variables
directory = "./out/" # directory of output files
name_rotor = "rotor" # rotor position files names (without _N.txt)
name_mirror = "mirror.txt" # mirror position file name (with ext.)
name_disp = "disp.txt" # displacement file name (with extension)
```

You can also choose what is included and how the result is shown :

```
printed_text = "" # optional text to add to the figure
view_infos = True # include informations (masses) ? (ax3)
view_text = True # include text ? (ax4)
to_gif = True # export to GIF ?
to_screen = True # show the result ?
```

4 Run

Before running FROMAGE and FETA, it is strongly recommended to clean the `./out/` directory (or make sure every file will be overwritten).

Then, run FROMAGE using :

```
./fromage ./cfg_files/myconfigfile.cfg
```

(where `myconfigfile.cfg` is your config file).

Eventually, FETA can be run using one of the following command :

```
python feta.py # Linux and Windows
python3 feta.py # Linux, MacOS and Windows
python3.10 feta.py # Specify which version of python to use
```

FETA will save an animated image named `feta.gif` if `to_gif` is set to `True`.

5 Limitations

Above 25 000 elements, the visualization begins to slow down. It is not recommended to use FETA with a relatively big grid parameter (above $50 \times 50 \times 50$).

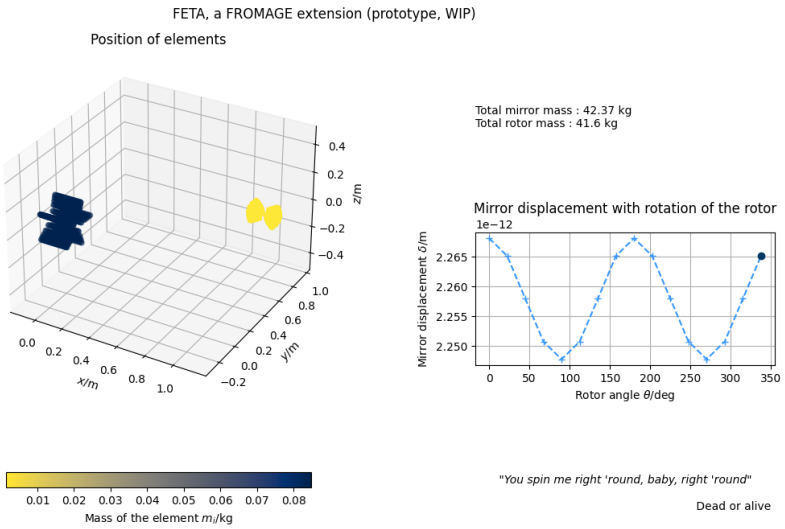

Figure 1 – FETA running an example file.