

File Structure

Experiment Directory Format

Experiment Directory → Shock1.exp, Shock1.rho, Shock2.exp, Shock2.rho, etc. are within 1 subdirectory of specified directory. If multiple shocks of the same number exist, the highest level one is used.

- Search specified directory and 1st level subdirectories for “.exp” file
- Use “.exp” file’s root directory as directory for .rho, and raw signal files

Experimental Parameters Format (“.exp” file)

The experimental files holds experimental information in a configuration file format. Required fields are:

Parameter	Shorthand Name	Units
Driven section temperature	T1	°C
Driven section pressure	P1	Torr
Driver section pressure	P4	Psi
Pressure transducer spacing	PT Spacing	mm
Avg time between transducers	tOpt	μs
Sample Rate*	SampRate	Hz

- This parameter, while still required, is only used in conjunction with the optional raw experimental observable file

One solution if your experiment is not shock tube-based is to set the mixture within Frhodo, alter T5 and P5, and then copy the conditions (T1, P1, and U1) to make into an .exp file. This will create an experiment file that will give you your specified conditions and load properly whenever you change shock number.

The incident shock velocity (U1) is set by PT Spacing/tOpt. If this does not fit your experiment, you could set tOpt to be 1/conversion factor between the expected units [mm/μs] and your experimental units. Then you can simply set PT Spacing to be your shock velocity.

Below is an example of what the configuration file would look like. Species can be extended beyond 1.

```
[Mixture]
Mol_0_Formula="Kr"
Mol_0_Mol frc=0.960
Mol_1_Formula="cC7H14"
Mol_1_Mol frc=0.040

[Expt Params]
T1=21.000000
P1=5.010000
P4=30.000000
tOpt=116.557292
PT Spacing=120.000000
SampRate=50000000.000000
```

Experimental Observable Format (".rho" file)

Data is expected to be in CSV format with no headers. Column 1 is the time in μs and column 2 is the experimental observable in CGS units. Below is an example of the experimental observable file.

```
1.493735E-1,3.551242E-4  
1.693735E-1,3.529244E-4  
1.893735E-1,3.501086E-4  
2.093735E-1,3.450050E-4  
2.293735E-1,3.379656E-4  
2.493735E-1,3.284624E-4  
2.693735E-1,3.185193E-4
```

Raw Experimental Observable Format (".sig" file)

Note: This file is completely optional.

Frhodo will function without it. The only loss is that the "Raw Signal" plot will be empty.

Data is expected to be a single column of values in a text document. These values are assumed to be sampled at the frequency taken from the ".exp" file's Sample Rate with time 0 being the first value. Below is an example of the raw experimental observable format.

```
738  
752  
756  
743  
743  
755  
744
```