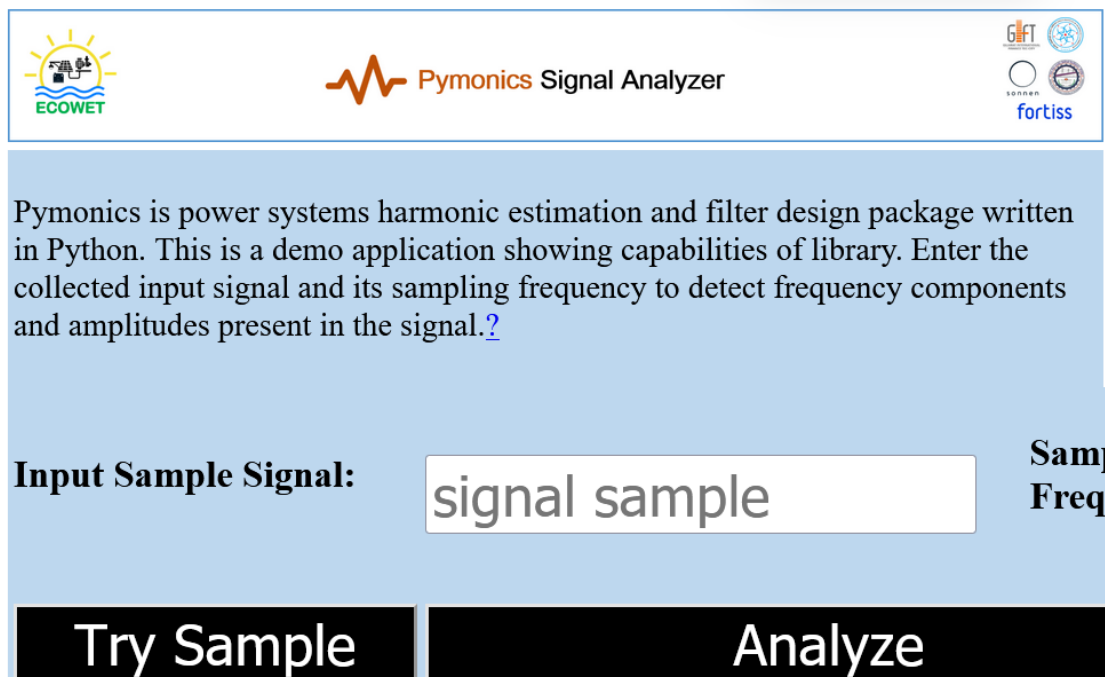# Help document for Pymonics tool

This tool is useful for harmonic/interharmonic analysis. This tool uses Eigenvalue Decomposition method to find out the frequency components present in the signal. The related mathematics and other details can be found out in the paper mentioned in the footnote* (*Please cite this paper if you are using pymonics tool in your work*). Sampled signal can be captured from the point of common coupling. Signal sampling rate must be kept greater than Nyquist sampling rate criteria i.e., more than ten times the frequency of highest order harmonic/interharmonic. Thus, for an unknown signal sampling rate must be taken sufficiently large enough so that the above criteria are satisfied.

Steps for using Pymonics tool

1. Save your sampled data in CSV format. Then copy and paste your data to the Signal Sample data tab.

*A. K. Srivastava, A. N. Tiwari, S. N. Singh, V. Pampana and M. Duchon, "Harmonic Frequency Estimation with MEMO-ESPRIT Technique using MATLAB and Python," 2020 IEEE 7th Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON), 2020, pp. 1-4, doi: 10.1109/UPCON50219.2020.9376423.

Here

2. Enter the sampling frequency value you used to sample data.

Sampling Frequency: `frequency`
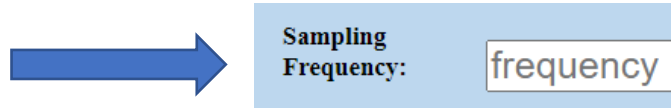
3. Click on Analyze button.

Analyze
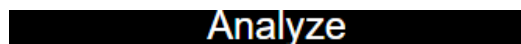
4. After analysis with *pymonics* tool you will be able to find out the harmonic/interharmonic components present in your signal. If you find any dominating harmonic or interharmonic component that you want to remove, you can use filter design section. Filter design section gives you opportunity to get design parameter for passive filters (Single tuned and High Pass).

Single Tuned Filter

For Harmonic/Interharmonic Analysis

Pymonics Signal Analyzer

R

L

C
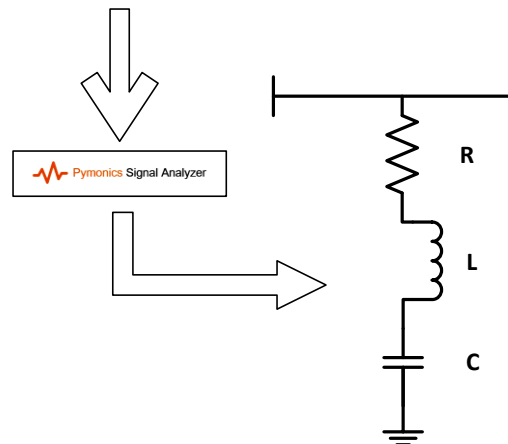
Filter Design:

Enter required
parameters here

Tuning point, **h:** `16`

Reactive power, **Qc:** `2.0`

Quality factor, **Q:** `0.8`

System frequency, **f:** `50.0`

System voltage, **V:** `11`

Calculate

Press this button to get R, L and C values.

Note: This tool is created with the help of Pymonics python library:

https://github.com/ECOWET-Toolset/Pymonics