# The Function of Fault Characteristic Frequency Ratio (FCF-Ratio)

Feature extraction based on FCF-Ratio.

## Description

FCF-ratio is the log ratio of the two existing features: BPFI amplitude and BPFO amplitude. "Data Upload" is used to load the required data set and label set, and the required parameters should be set in the "Parameter" field.

## Parameter introduction

Parameters of FCF-Ratio:

Sample parameter:

* Sampling frequency: Sampling frequency of the bearing. (data type: float)

Bearing parameters:

* Rotation frequency: Rotation frequency of the bearing. (data type: float)
* Number of rolling elements: Number of balls. (data type: int)
* Ball diameter: Diameter of balls. (data type: float)
* Pitch diameter: Pitch diameter. (data type: float)
* Initial contact angle: Initial contact angle. (data type: float)

Function parameters:

* Level: Decomposition levels. (data type: int)
* Order: The order of the fault frequency. (data type: int)
* FCF-ratio Image: Whether to draw the FCF-Ratio diagram.

**Functional description of the main components**

The overall view of the function of FCF-Ratio is divided into "Data Upload", and "Parameter".

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### Data Upload

The user needs to upload the data file and the label file. The uploaded data files and label files support ".mat", ".txt", ".csv", ".xls", and ".npy" format files.

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### Parameter

The user can set the parameters here.

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### Result

After the software has been run, click the "Download" button to download the relevant result data.

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**Examples**

The process of using FCF-Ratio in feature extraction.

**Step 1: Configure the procedure**

Select "Feature Extraction and Reduction" from the process bar on the left side of the web page.



Then select the procedure that needs to be configured from the process display area.

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**Step 2: Upload the data file and the label file**

Select the data file and the label file to be applied from the local path.

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Click "Upload" after successfully selecting the upload data file, and then click "Save".

**Step 3: Select the function**

The ''FCF-Ratio'' function is chosen for feature extraction.

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**Step 4: Set and save the parameters**

The user can set the parameters here.

Based on the selection of "True" or "False", the user can decide whether to draw the FCF-Ratio diagram.

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**Step 5: Execute the configured procedure**

Before executing the configured function, the user also needs to set the selected output file format.

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Finally, select "Run".

**Step 6: Download**

When the progress bar reaches the end, the task is completed.

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If the user selects "True" in "FCF-ratio Image", the FCF-Ratio diagram will be drawn and saved.

**图表, 条形图

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Click "Download" to download the file of data and image.

