Notes on BPM Data

For 10-12 November, there is a 10 Hz BPM data file saved for every shot*.

The location of the BPM data is:

/eos/experiment/awake/bpm_data/2018/11/<day>/

The name of the BPM files is:

BPM_data_<AWAKE_EB_TimeStamp>.h5

For example:

BPM_data_1541908053735000000.h5

The time stamp should EXACTLY match the time stamp of corresponding AWAKE EB file, e.g.:

1541908053735000000_165_212.h5

* About 4% of the BPM data files seem to be missing. Not sure why. . .

The BPM data file has the following structure:

BPM_file['TIME_ARRAY'] – a list of 10 Hz acquisition times, 1D (10 Hz index)

BPM_file['BPM_H_10HZ'] – a list of 10 Hz horizontal BPM data, 2D (10 Hz index, BPM#)

BPM_file['BPM_V_10HZ'] – a list of 10 Hz veritcal BPM data, 2D (10 Hz index, BPM#)

BPM_file['BPM_S_10HZ'] – a list of 10 Hz sigma BPM data, 2D (10 Hz index, BPM#)

BPM_file['BPM_P_10HZ'] – a list of 10 Hz 'posOK' BPM data, 2D (10 Hz index, BPM#)

BPM_file['BPM_H_AVG'] – a list of 1 Hz average horizontal BPM data (same as timber), 2D (1 Hz index, BPM#)

BPM_file['BPM_V_AVG'] – a list of 1 Hz average vertical BPM data (same as timber), 2D (1 Hz index, BPM#)

BPM_file['BPM_S_AVG'] – a list of 1 Hz average sigma BPM data (same as timber), 2D (1 Hz index, BPM#)

BPM_file['SPS_BOOL'] – a list of 1 Hz events signifying whether or not extraction occurred (1 Hz index)

BPM_file['SPS_INDEX'] – a list of 1 Hz events signifying which shot is the extraction shot (1 Hz index)

BPM_file['AWAKE_EXT'] – a single boolean indicating whether or not an SPS extraction event is in the file

BPM_file['SPS_BPM_H'] – a list of horizontal BPM readings corresponding to the extraction shot, 1D (BPM#)

BPM_file['SPS_BPM_V'] – a list of vertical BPM readings corresponding to the extraction shot, 1D (BPM#)

BPM_file['SPS_BPM_S'] – a list of sigma BPM readings corresponding to the extraction shot, 1D (BPM#)

BPM_file['SPS_BPM_S'] – a list of 'posOK' BPM readings corresponding to the extraction shot, 1D (BPM#)

The BPM data file has the following structure:

BPM_file['TIME_ARRAY'] – a list of 10 Hz acquisition times, 1D (10 Hz index)

BPM_file['BPM_H_10HZ'] – a list of 10 Hz horizontal BPM data, 2D (10 Hz index, BPM#)

BPM_file['BPM_V_10HZ'] – a list of 10 Hz veritcal BPM data, 2D (10 Hz index, BPM#)

BPM_file['BPM_S_10HZ'] – a list of 10 Hz sigma BPM data, 2D (10 Hz index, BPM#)

BPM_file['BPM_P_10HZ'] – a list of 10 Hz 'posOK' BPM data, 2D (10 Hz index, BPM#)

BPM_file['BPM_H_AVG'] – a list of 1 Hz average horizontal BPM data (same as timber), 2D (1 Hz index, BPM#)

BPM_file['BPM_V_AVG'] – a list of 1 Hz average vertical BPM data (same as timber), 2D (1 Hz index, BPM#)

BPM_file['BPM_S_AVG'] – a list of 1 Hz average sigma BPM data (same as timber), 2D (1 Hz index, BPM#)

BPM_file['SPS_BOOL'] – a list of 1 Hz events signifying whether or not extraction occurred (1 Hz index)

BPM_file['SPS_INDEX'] – a list of 1 Hz events signifying which shot is the extraction shot (1 Hz index)

BPM_file['AWAKE_EXT'] – a single boolean indicating whether or not an SPS extraction event is in the file

BPM_file['SPS_BPM_H'] – a list of horizontal BPM readings corresponding to the extraction shot, 1D (BPM#)

BPM_file['SPS_BPM_V'] – a list of vertical BPM readings corresponding to the extraction shot, 1D (BPM#)

BPM_file['SPS_BPM_S'] – a list of sigma BPM readings corresponding to the extraction shot, 1D (BPM#)

BPM_file['SPS_BPM_S'] – a list of 'posOK' BPM readings corresponding to the extraction shot, 1D (BPM#)

Example from load_bpm_data.py