# **TUPV027** EPICS DAQ SYSTEM FOR BEAM POSITION MONITOR AT THE KOMAC LINAC AND BEAMLINES



**Device Support** 

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#### Linac BPM

The original plan was to simultaneously measure the beam position and beam phase using Linac BPM, but now only the beam phase is being measured.



Application for beam phase measurement - RF phase scan



#### Replace the baseboard to use the 4 channel

For beam phase measurement, one of the BPM electrode signals is measured in the LLRF ADC.





When using the PENTEK7142, it is confirmed that the PCI bus spec of the MVME5100 did not fit and that the MVME3100 is suitable.

#### Microprocessor: MPC7410

**MVME5100** 

**MVME3100** 

Clock Frequency: 500 MHz

Secondary Cache: 2MB



64-bit/33 MHz Local PCI Bus

Microprocessor: MPC8540 66/100 MHz 64-bit PCI-X Clock Frequency: 667 MHz On-chip Cache (I/D): 32K/32K Secondary Cache: 256KB PCI Bus Clock: 64-bit/33/66/100MHz

Accordingly, the baseboard of the timing system, LLRF, and BPM, which are SBC (Single Board Computer) type control systems used in KOMAC, are unified into MVME3100.



- From the IF signals of 4 sets measured,





Channel Access

#### Linac BPM test stand & User interface

Position mapping data of BPM are measured to check the accuracy and precision, and the calibration value is obtained and applied the BPM DAQ system to monitor the beam positions in real time.

As a result, the BPM DAQ system was installed in the klystron gallery, and a user interface was also installed in the control room.









# Linac BPM

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# Linac BPM upgrade

Using a 4-channel digital board, IF signals are measured from 4 BPM electronics.

LO (300MHz)

IF (50MHz)

50 60

- From the IF signals of 4 sets measured,
  - Beam position  $\checkmark$
  - Beam phase  $\checkmark$
  - Beam current  $\checkmark$

Linac BPM

BPF (350MHz)

IQ sampled data from the digitizer board is transmitted to the baseboard through the PCI bus



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### **MVME5100**

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Analog frontend consists of RF components including a mixer, 4-way splitter, 350MHz band pass filter, low pass filters.





#### EPICS IOC / MVME5100 & Digital board



### User interface

