

## J-PARC Hadron Hall : EXPERIMENTAL REPORT on RUN #78

		Date(submitted)	2018/02/28
Group	E21 (COMET)	Beam line	K1.8, MR-ABD
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### Summary and Results

MR 8-GeV operation campaign was performed in two periods, 20-24/Jan and 10-14/Feb, separately. For each period, night time was assigned as a machine time for the experimental group while accelerator study was performed during daytime except for the last day. In parallel to the accelerator study, experimental group used their machine time to optimize the DAQ system which is dedicated to measure the beam extinction with a sensitivity of  $<10^{-10}$ . Thanks to many efforts by MR SX group, stable bunched-SX was finally established; Experimental group carried out the beam-extinction measurement during 7<sup>th</sup> night and 24 hours of last day. In addition to this main measurement, 5<sup>th</sup> night was assigned to measure the beam-extinction factor at MR-ABD with FX beam. This is to understand the mechanism of beam-extinction development even within MR before the extraction to HD. One parasite test was also performed, 2 prototypes of diamond-base proton beam monitor were equipped with the extinction detector at K1.8 and tested with pulsed pion beam.

### Summary of results

- (1) Bunched-SX with 8-GeV proton beam was established, and the bunched timing structure of secondary particles was observed at K1.8.
- (2) Extinction improvement was successfully demonstrated by employing the special injection at MR.
- (3) Good enough extinction of  $< 6E-11$  was obtained at K1.8 with bunched-SX beam which is consistent with the extinction factor measured at MR-ABD with FX beam.
- (4) Prototype diamond detector was successfully tested with the secondary beam for extinction measurement.

### SCHEDULED and EXECUTED MACHINE TIME, BEAM CONDITION, DOWN TIME, Priority etc.

Day-1-2 (20-21/Jan), No beam was delivered to HD. MR study was mainly conducted.

Day-3, Scheduled (23/Jan 00:00 – 23/Jan 09:00, 9h), Executed 5.4h (Rest was used for accelerator study)

Beam condition; 1shot/1bunch operation, power = 0.4 kW

Day-4, Scheduled (24/Jan 00:00 – 24/Jan 09:00, 9h), Executed 6.8h (Rest was used for HD beam study)

Beam condition; Continuous/4bunch, power = 1.7 kW

Day-5, Scheduled (10/Feb 21:00 – 11/Feb 09:00, 9h), Executed 10h (Extra 1h was moved from MR study)

Beam condition; 1shot/1bunch operation, power = 0.4 kW (Beam was delivered to MR-ABD)

Day-6, Scheduled (12/Feb 00:00 – 12/Feb 09:00, 9h), Executed 4.5h (Down time due to PS problem)

Beam condition; Continuous/4bunch, power = 1.7 kW

Day-7-8, Scheduled (13/Feb 00:00 – 14/Feb 09:00, 33h), Executed 33h (No down time)

Beam condition; Continuous/4bunch, power = 1.7 kW (MR RF was sometimes lowered down to 30kV)