



# Accelerator Summary

<b>Experience with machine protection system at J-PARC</b>	<i>Naoki Hayashi</i>
<i>Emmy Noether</i>	10:30 - 10:50
<b>Experience with and plans for Machine protection system at ESS</b>	<i>Martin Carroll et al.</i>
<b>Experience with controls tools at J-PARC</b>	<i>Hiroshi TAKAHASHI</i>
<i>Emmy Noether</i>	11:05 - 11:20
<b>Experience with controls tools at ESS</b>	<i>Arek Gorzawski</i>
<i>Emmy Noether</i>	11:20 - 11:35
<b>Beam commissioning at the MLF target station</b>	<i>Dr. Shin-ichiro Meigo</i>
<i>Emmy Noether</i>	11:35 - 11:50
<b>Discussion time</b>	
<i>Emmy Noether</i>	11:50 - 12:00

<b>Klystron RF station test and operations at ESS</b>	<i>Dr. Morten Rostrup Forup Jensen</i>
<b>Experience with the ESS SML modulators</b>	<i>Carlos De Almeida Martins</i>
<i>Emmy Noether</i>	13:15 - 13:30
<b>Recent progress in LLRF</b>	<i>Kenta Futatsukawa</i>
<i>Emmy Noether</i>	13:30 - 13:45
<b>Experiences of klystron operation</b>	<i>Yasuhiro Fuwa</i>
<i>Emmy Noether</i>	13:45 - 14:00
<b>Status of accelerating cavities</b>	<i>Yasuhiro Kondo</i>
<i>Emmy Noether</i>	14:00 - 14:15
<b>Status of beam monitor for linac</b>	<i>Katsuhiro Moriya</i>
<i>Emmy Noether</i>	14:15 - 14:30
<b>Beam Diagnostics experience at ESS</b>	<i>Thomas Shea</i>
<i>Emmy Noether</i>	14:30 - 14:45



# Some lessons learned

- Out schedule was perhaps a bit too optimistic (although we did have some contingency)
- We should have anticipated some level of technical difficulties



# Highlights

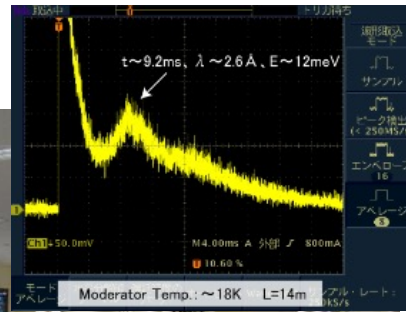
Mainly from the point of view of an ESS person

- One hour soft beam limiter used at JPARC
- Different actuators used for MPS to shut down beam
- Change management for MPS differs at J-PARC and ESS
- Management of array data common problem
- J-PARC use Java for OPIs. Moving to CSS, but see some missing features
- uTCA.4v used for LLRF at J-PARC (but different hardware than ESS)
- One klystron replaced due to vacuum issues at 80000h, expected lifetime is 50000h
- Non-negligible downtime due to RFQ trips handled by changing MPS strategy
- Large activation found at last JPARC dipole, due to back-streaming neutrons from target
- Power ramp up: Accelerator is easy! Target is hard!

# 1<sup>st</sup> beam commissioning at MLF

- For the first beam, easily irradiation ~5 kW beam on the target (just one shot of beam required for both beam transport and neutron production confirmation).
- Almost beam tuning was made with single shot mode.
- User operation started with 5 kW on Sept. 2008 with muon production. User operation 20 kW and 100 kW started on Dec. 2008 and Nov. 2009, respectively. (and then, see next page)

[CTOF: JNST 37 2000](#)



1<sup>st</sup> neutron beam May 30 2008



1<sup>st</sup> muon beam Sept 26 2008

# Beam Accounting – Beam Loss

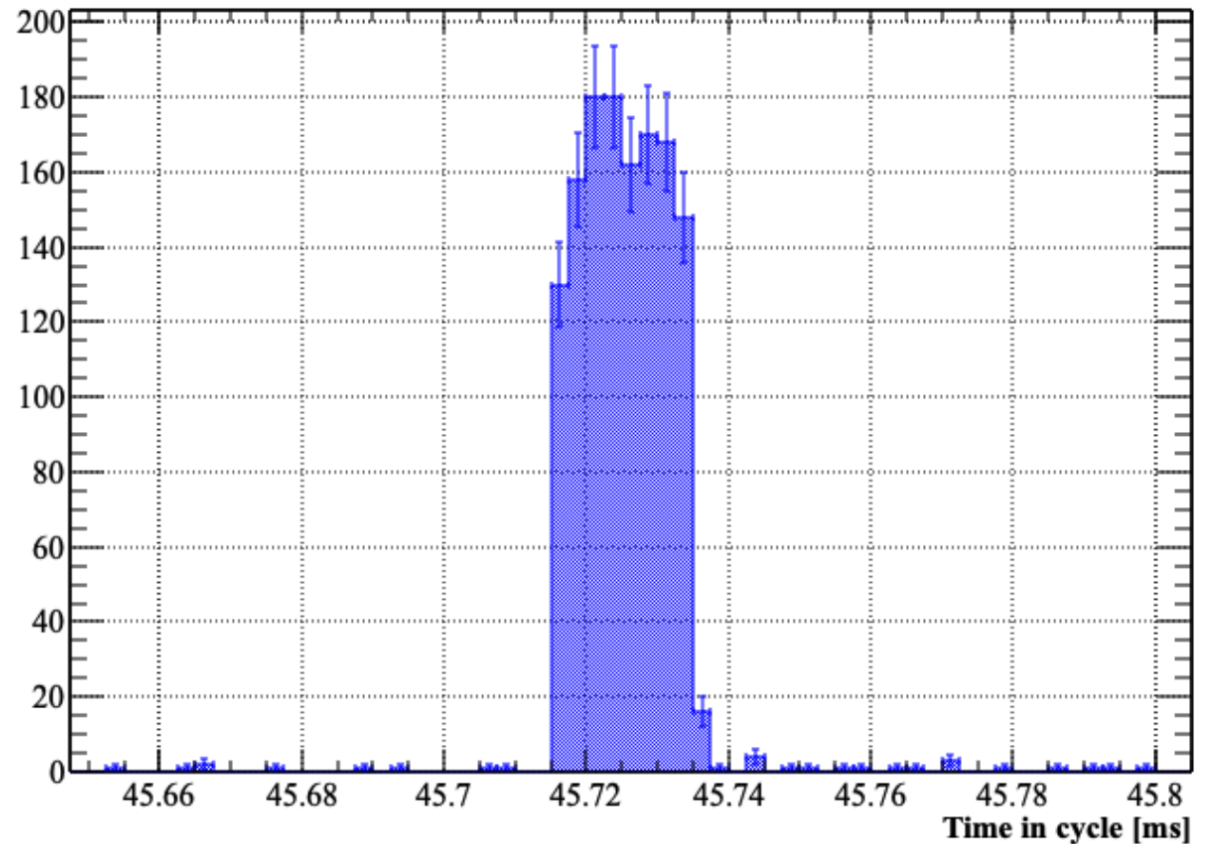


## Fast neutron detector

Two detector types have been deployed:

- Slow: moderator, Boron capture reaction
- Fast: no moderator, n p recoil reaction

Intentional beam loss of 3.6 MeV protons on TZM chopper dump



Demonstration of time response during loss of 20  $\mu$ s beam pulse