

PSI

# Status and plans for HIPA motion

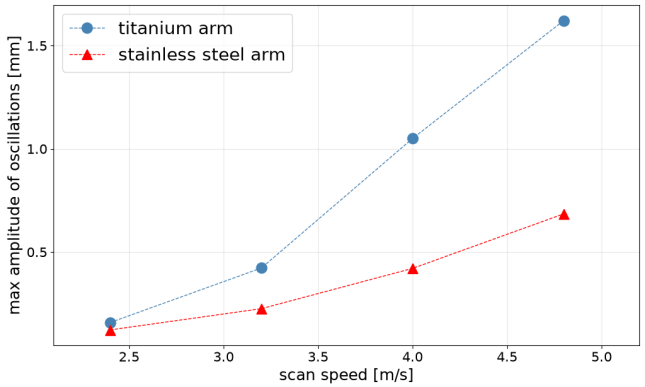
**Mariusz Sapinski,**
**PSI, October 21, 2026**

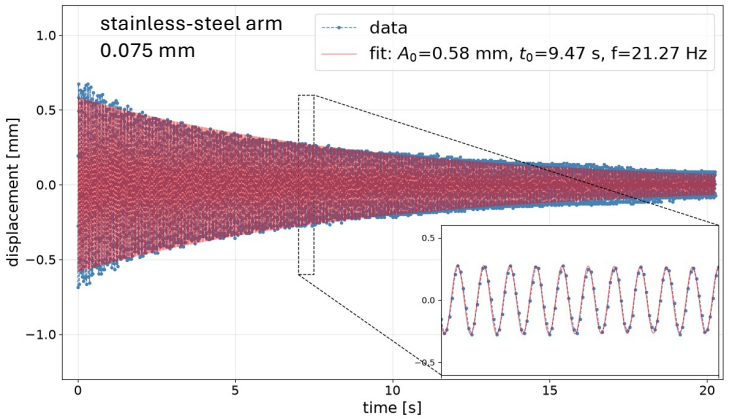
# Outlook

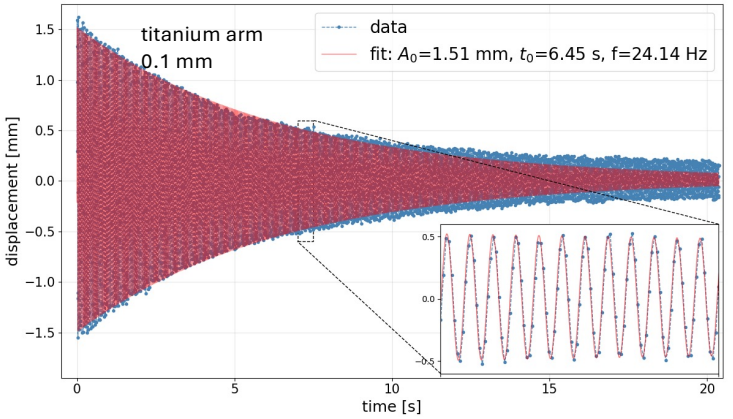
1. Oscillating Arm Wire Monitor status and plans
2. WIPAM replacement plans
3. MESON replacement

# Oscillating Arm Wire Monitor

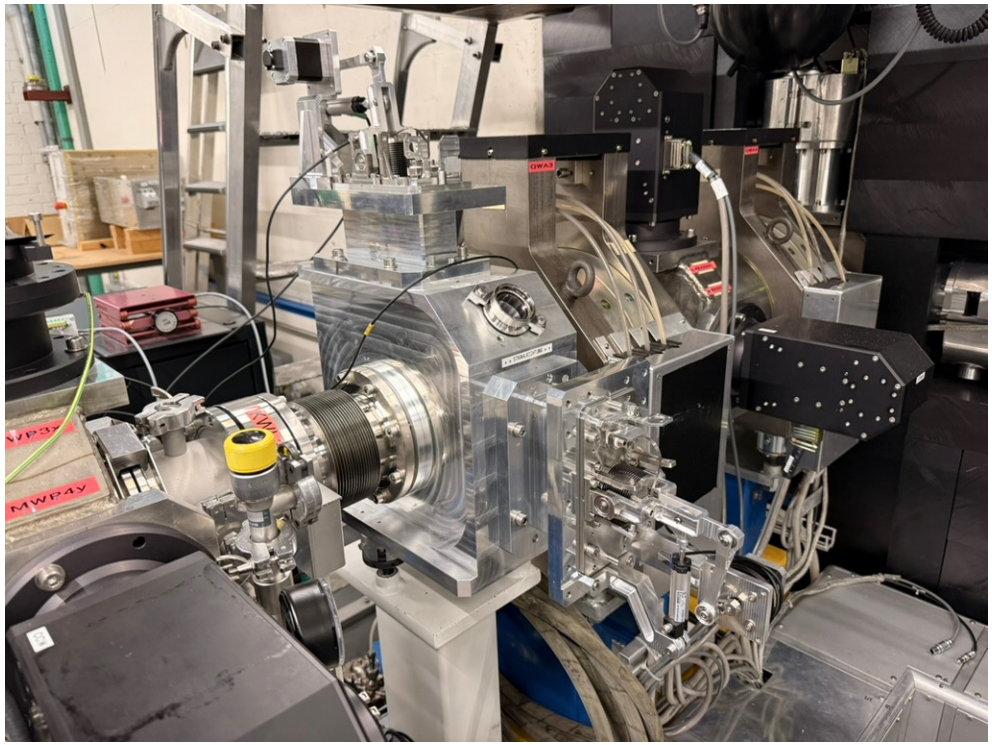
1. Vibration measurements in the lab – done. (thanks to M. Le Chenadec)
2. Significant differences between stainless-steel and titanium arms.
3. In both cases amplitudes are far from colliding, a waiting time in between scans of 3 seconds.
4. Endurance test positive (10000 scans).



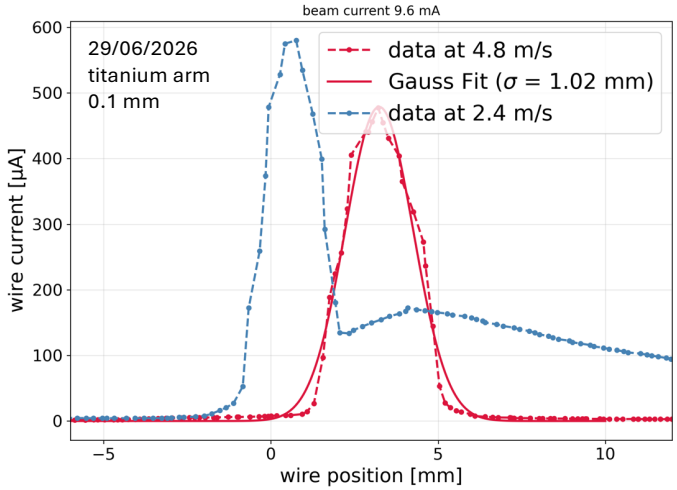
# Oscillating Arm Wire Monitor – installation in CW

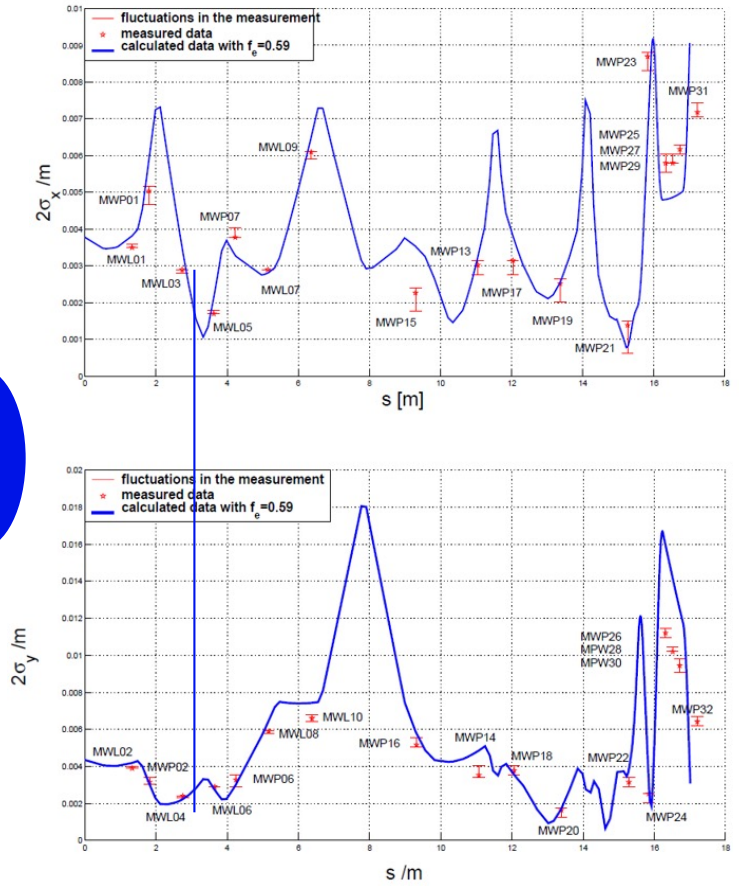



- Vertical scanner installed in June.
- Horizontal scanner installed yesterday.
- Driven by ECMC controlling stepper motors.
- Potentiometer and wire signal read by SoM-CAM.
- Motion triggered by SoM-CAM.

# Oscillating Arm Wire Monitor

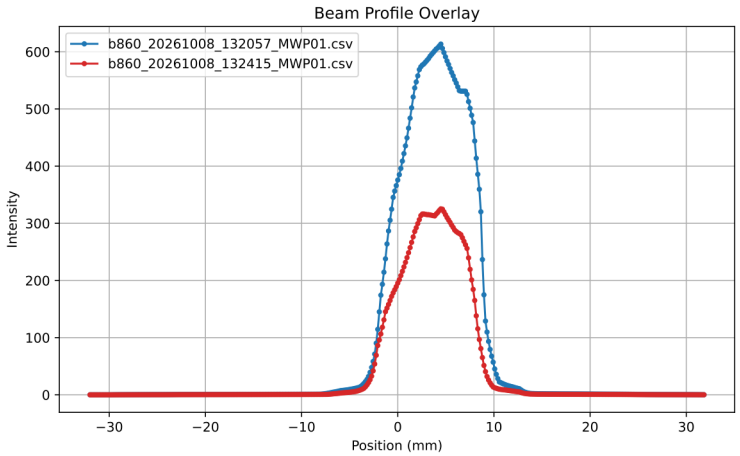
1. First beam measurements show capacity to measure full beam (9.6 mA).
2. In the position of the test monitor beam size is quite extreme: $\sigma_h \approx 1.5$ mm, $\sigma_v \approx 3$ mm
3. Initial sampling 10 kHz, later increased to 50 kHz

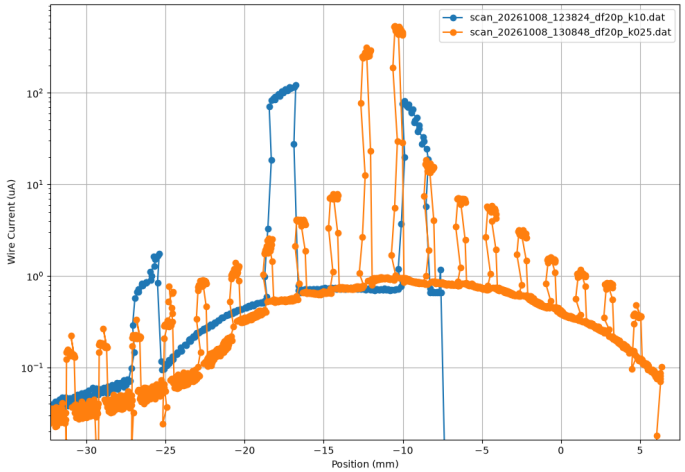


# Oscillating Arm Wire Monitor - first issue

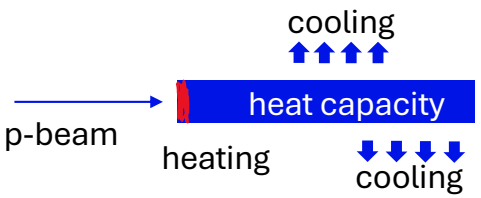
1. Operators often use AVKI kicker to decrease beam intensity during setup.
2. This works with typically 500 Hz.
3. MWP monitors work up to duty factor of 20%, so each pulse is 0.4 ms long.
4. Legacy MWP monitors are synchronized with those pulses, so they show the actual beam profile,
5. OAWM with SoM-CAM + ECMC does not have this synchronization yet.
6. Plot: DF=20% (EWBRI=2.1 mA) speed 4 m/s and 1 m/s.
7. We will need synchronization and possibility to lower the scan speed down to 0.5 m/s (k=0.125).

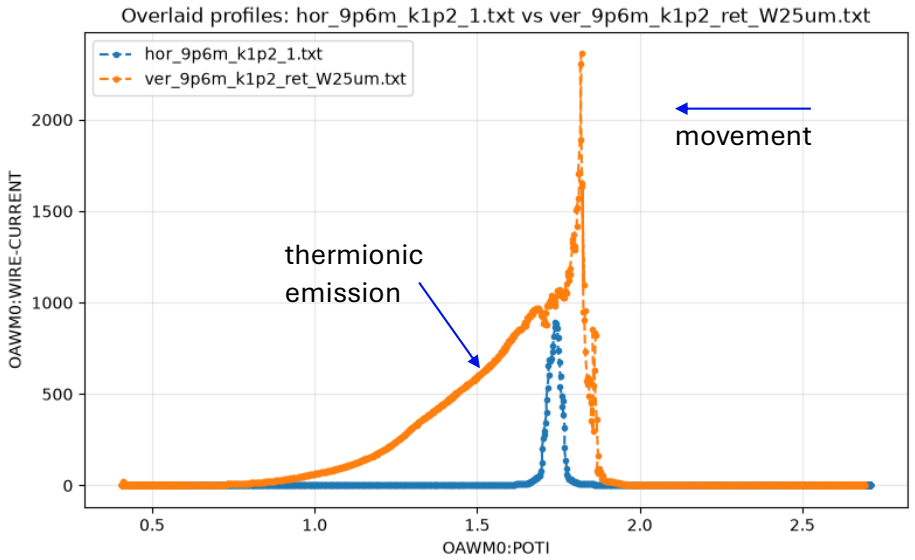


# Oscillating Arm Wire Monitor - second issue

1. We tried 3 different wires to measure the vertical profile, they all broke. Profiles are unusual. Is there additional coupling to the beam?
2. $N_{prot} \propto d_{wire}/v_{wire}$
3. Solutions:
   - Higher speed
   - Thinner wire (tried down to 25 um)
   - Band instead of wire



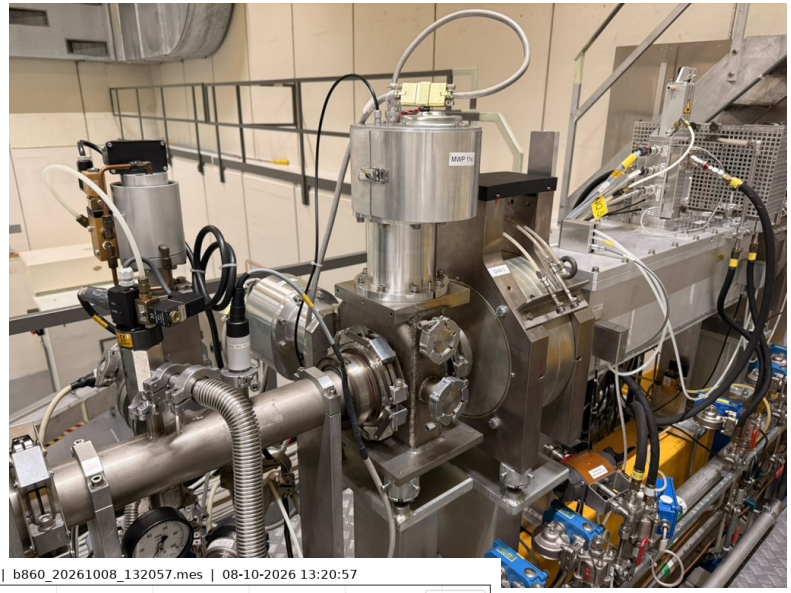

Next step is further investigation, going back to R&D, however...

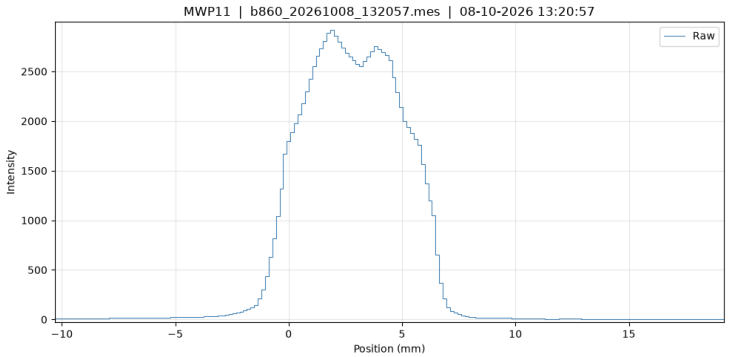
# Oscillating Arm Wire Monitor - installation

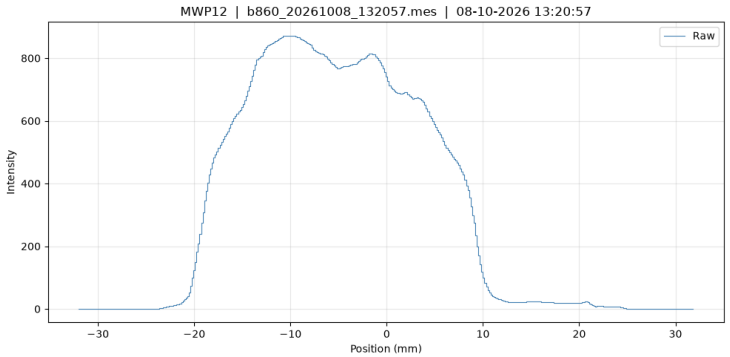
It would be beneficial to replace MWP11/12 with OAWM this winter.

Why?

- Getting experience in radiation and EMI environment.
- MWP11/12 are easily accessible and beam sizes are large. There we can scan with 4.8 m/s and we don't expect problems.





# WIPAM replacement

1. Second priority (after OAWM).
2. ECMC solution tested with the longest cable we have between electronics and scanner (MYP19/MYP20) – about 120 meters.
3. Very positive result, cleaner poti signal.
4. ECMC provides smoother motion than legacy drives.
5. No integration with SoM-CAM yet.
6. Next steps:
   - Deploy ECMC and SoM-CAM in WIHA.
   - Use MYP13/14 as test monitors in 2027.

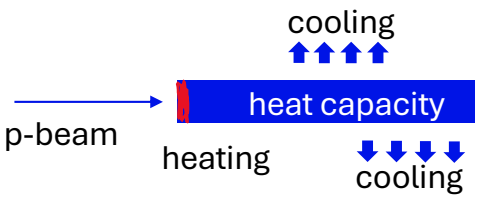
# MESON replacement

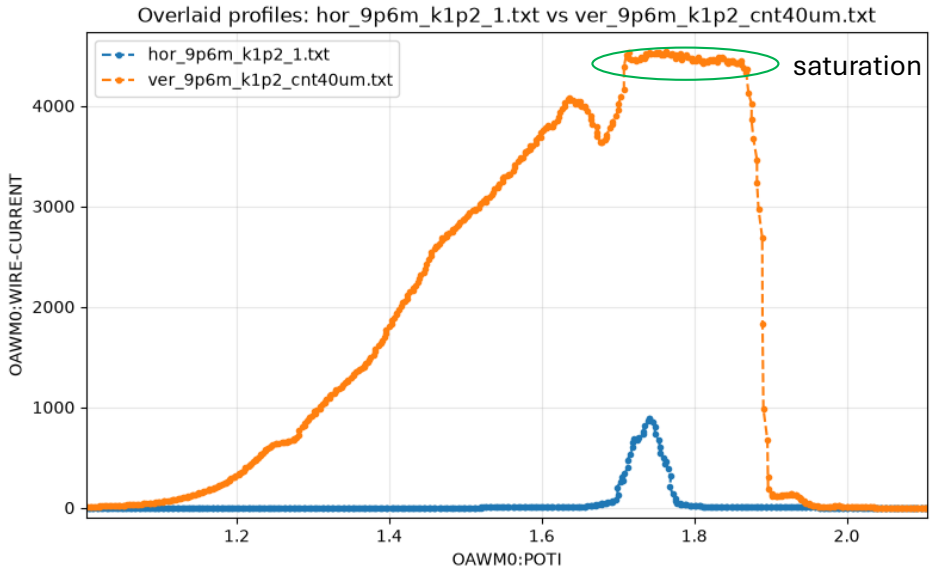
1. Third priority but it we should have it for HIMB (2028).
2. Proposal: use MBPT1 as test monitor.
3. Remark: MESON use case for long radial probes is particularly interesting for operation.

# Additional slides

# Oscillating Arm Wire Monitor - second issue

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