

MEETING MINUTES

Location: Zoom
Date: 7 April 2021
Time: 11am EDT
Indico event: <https://indico.cern.ch/category/8972/>
Attendees: Eric, Silvia, Jean, Jamie, Suba, Leonardo, Manuele, Zenghai, Naeem.
Minute taker: Silvia
Reviewed: N/A

SCOPE OF THE MEETING

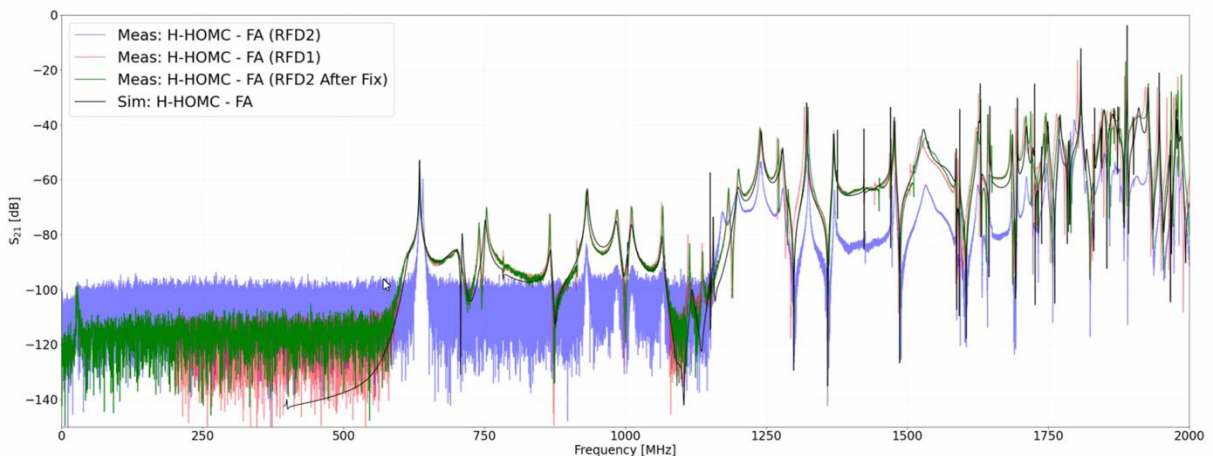
Weekly HL-LHC RFD HOM couplers follow-up meetings.

NEXT MEETING

14 April 2021.

DISCUSSION POINTS

- Connection problem in one of connectors, between inner pin and mating clamp not touching completely and thus introducing a capacitive coupling, led to high noise at low frequencies and good transmission at higher frequencies but with lower power level than expected. When the connection problem was solved, the measured S21 from H-HOM to FA for RFD2 matched the simulated curve (except close to fundamental mode, because expected S21 at low frequencies is too low, so noise is larger than that).
- Apart from that adaptors work pretty well.



RFD2 FA was not correctly connected during Vertical Test (blue curve), new adaptor (green curve) identical as RFD1 (red curve)

- Naeem points out that Ofelia's report on stresses in RF ancillaries due to transportation was done assuming flange of stainless steel. That is the case for AUP's design (although copper sleeve is not included in simulation), but not CERN's design, which uses titanium corona with flange ring of stainless steel. So results seem to apply to AUP's design and show no concerns for transportation, because study is conservative and stresses are factor 10 lower than yield of copper.
- ACTIONS:
 - o Jamie will send 3D drawing of adaptor to AUP.
 - o Zenghai, Suba will check EM model of long adaptor before launching fab.
 - o Paolo, Manuele will verify long design can work in their facility.
 - o Eric will launch fab of 25-50 Ohm long adaptors: 4+2 for CERN and 4+2 for AUP.

ACTION ITEMS

	Action	Responsible	Status	Update
0	Upload slides to Indico	All	Applies always	Eric needs to grant Jamie access
1	Check which gasket type was used for RF ancillaries joints in the VTA cold tests	Eric, Nuria	Pending (Mar. 24, 2021)	
2	Check if flanges for FPC, beam ports are Nb-coated to reduce losses in VTA cold tests (VTA cold test procedure should include assembly description)	Eric, Nuria	Pending (Mar. 24, 2021)	
3	Write VTA cold test procedure that includes assembly description	CERN, AUP	Pending (Mar. 24, 2021)	
4	Share metrology of PU and VHOM with AUP	Eric	On-going (Dec. 1, 2020)	
5	Share CERN MIP for VHOM and PU with Naeem	Eric	On-going (Nov. 23, 2020)	HHOM MIP available at EDMS 2278016 v.1.0
6	CERN to provide 2-3 sacrificial feedthroughs for transport evaluation.	Eric	On-going (Oct. 16, 2019)	Naeem received the ceramics. Eric will send feedthroughs too.
5	Which g force do the RF ancillaries need to survive in the shock test?	Silvia will contact Ofelia, CC Eric	On-going (Oct. 22, 2019)	CERN studies and specs – see: <ul style="list-style-type: none"> - EDMS 2321886 (study report) - EDMS 2043014 chapter 18.2 (cryomodule specs) - EDMS 1389669 transport loads 4.1.4.3 (dressed cavity specs) - Pending: drop study

				Parallel effort at FNAL (structural analysis – prelim shows 5g is ok) and tests with feedthroughs from CERN.
7	Share drawings of gaskets with AUP	Eric, Nuria	Pending (Jan 20, 2021)	
9	Share prelim drawing of transition with AUP	Eric	Pending (Mar. 24, 2021)	
10	Develop mechanical design of AUP adapter	AUP	Pending (Feb 3, 2021)	
11	Launch fab of second test box at CERN	Eric	On-going (Feb 24, 2021)	Started.
12	Plot S21 curves for both CERN and AUP adaptors	Zenghai, Jamie	On-going (Feb 24, 2021)	Done - to be uploaded by Jamie in Indico.
13	Update HOM qualification test document with AUP comments	CERN	On-going (Mar. 3, 2021)	On-going, expect next version by April.
14	Send 3D drawing of adaptor to AUP	Jamie	Pending (Apr. 7, 2021)	
15	Last EM check of long adaptor before launching fab	Zenghai, Suba	Pending (Apr. 7, 2021)	
16	Verify long adaptor design works in FNAL VTA	Paolo, Manuele	Pending (Apr. 7, 2021)	
17	Launch fab of 25-50 Ohm long adaptors: 4+2 for CERN and 4+2 for AUP.	Eric	Pending (Apr. 7 2021)	
	Add accelerometer in the shock tests.	Eric	Pending (Oct. 16, 2019)	Eric inquired about accelerometer type/brand for shock test. Not needed anymore.
	Share 25 Ohm connector design with AUP	Eric	Closed	LHCACFHC0401/2
	Send ceramics to Naeem	Eric	Closed	Arrived.
	Check NA configuration to measure directly at 25 Ohm, incl. calibration requirements for 25 Ohm option.	Eric, Jamie	Closed	Email Nov. 12 2019. See also meeting on Oct. 20, 2020.

	Share tooling drawings with Naeem	Eric	Closed	
	Send 3D mech design of RF ancillaries to Suba, Naeem, others and upload in EDMS	Eric	Closed	
	Upload STP of 3D vacuum model in EDMS 2366191 v2. Ensure that parameterization for RFD RF ancillaries is in the same EDMS doc.	Jamie	Closed	Files in DocDB now also in EDMS 2366191 v2 Zenghai provided links to 3D vacuum model STP file, step-by-step procedure for building up vacuum model, and impedance table by email on April 21, 2020.
	Share with Jean the brazing procedure for feedthroughs with titanium flange	Eric	Closed	
	Calculate conversion of 10W power leakage from fundamental mode through HOM filters to the unit (dB) which is more useful in warm qualification of HOM filters.	Zenghai	Closed	
	Confirm brazing materials to Naeem and verify materials list.	Eric	Closed	
	Assembly procedures should include control step to verify 0.1 mm gap between port flange and feedthrough flange	Eric	Closed	See meeting Sep. 1, 2020.
	Add EDMS No. of HOM drawings to EDMS 2363558 (summary of models and studies reference)	Silvia	Closed	Drawings listed in the ICD.
	Generate summary drawing	Eric	Pending (Apr-07, 2020)	Not needed anymore.

	with RF ancillaries dimensions			
	Provide markup with corrected numbers	Naeem	Closed	On June 2, 2020, Naeem showed different dimensions for HHOM wall thickness between CERN and AUP drawings.
	Confirm material used for flanges of each RFD RF ancillary	Eric	Closed	Now in the drawings. Check in the drawings.
	Review dimension difference for HHOM wall thickness between CERN and AUP drawings	Eric	Closed	
	Upload heat load breakdown for RF ancillaries and tolerance study to EDMS. Add reference to summary of engineering and multi-physics studies (EDMS 2363558)	Zenghai	Closed, see FDR	
	Upload materials to past meetings in the Indico website: https://indico.cern.ch/category/8972/	Zenghai	Closed (May 01, 2020)	
	Send LARP test box model to Eric	Suba	Closed (Apr. 21, 2020)	https://indico.cern.ch/event/891360/
	Send EDMS Doc. No. to Eric with summary of engineering studies for the RFD crab cavity	Silvia	Closed (Apr. 21, 2020)	https://edms.cern.ch/document/2363558/0.2
	Share link to trim tuning procedure for RFD.	Alex	Closed (Oct. 23, 2019)	Email Oct. 23, 2019
	Check RFD RF ancillaries drawings	Zenghai/Suba /Paolo/Naeem	Closed (Nov. 26, 2019)	Propagating new design modifications from Zenghai
	Provide thermal simulations for VHOM and temperature distribution around the flange connection.	Eric, Ofelia	Closed (Jan. 28, 2020)	Uploaded in Indico 7 Jan. 2020: https://indico.cern.ch/event/891345/

	Ask accelerator model number	Leonardo	Closed (Oct. 22, 2019)	Email Oct. 22, 2019
	Check calculations for transport of HOM couplers.	Eric, Ofelia	Closed (Nov. 12, 2019)	Plastic deformation from transport of RFD HHOM coupler is negligible.
	Confirm that the HHOM helium jacket gets sufficient cooling through single inlet (in the past there was inlet and outlet for active cooling): LHCACFH0169	Eric, Ofelia	Closed (Nov. 26, 2019)	Discussion during meeting at CERN (week of Nov. 20).
	Add guiding pin to flange in LHCACFH0164	Eric	Closed (Nov. 12 2019)	No good for cleaning room
	Create Indico event for these meetings	Eric	Closed (18 Feb 2020)	https://indico.cern.ch/category/8972/
	Inform Suba about drawings that were corrected on Feb. 3, 2020.	Eric	Closed (email, Feb. 20, 2020)	https://edms.cern.ch/ui/#!/master/navigator/document?D:100502025:100502025:subDocs
	Share FDR agenda with CERN	Leonardo	Closed (Mar. 31, 2020)	https://indico.fnal.gov/event/23353/ (link for the dry-run agenda, which mirrors the actual agenda for the FDR – note that the dates are for the dry-run)