Linac4 RF System Operation for the Reliability Run in 2017

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Introduction

- Linac4 RF systems

- RF deployment until the Reliability Run

- RF deployment from the Reliability Run

- Linac4 RF Organization

- System Level Debugging

- Linac Operation (as seen from RF side)

- Linac Operation Issues

Linac4 RF Systems

- 3 Buncher, 1 Chopper
- 1 RFQ, 3 DTL, 7 CCDTL, 12 PIMS, 1 Debuncher

- 3 Buncher, 1 Debuncher Solid-State Power-Amplifier
- 17 Klystrons (9 LEP type, 8 new)

- Mechanical Tuners, RFQ Water Temperature Tuning
- Phase Shifters, Control Systems, EIS RF Interlock

- Low-Level RF Systems, Control Software

RF Deployment until RR

- Installation of debuncher cavity
- Conformance work on debuncher amplifier

- Water circuit verifications on DTL
- Pick-up replacement on DTL T2/T3 center probes
- Power coupler tuning on DTL

- Intervention on air cooling on CPI klystron PIMS03/04
- Adjustment of line length on one PIMS branch
    (phase shifter setting is at its limit)

RF Deployment until RR contd.

- Upgrade of tuner control (asap)
- Additional tuner control modules for 6 PIMS cavities
- Upgrade of cavity loop cards v0/v1 to v3 on 5 systems
- Chopper Drive Unit hardware / FESA completion
- Chopper Trigger Unit cards v2 FESA completion

- FESA implementation of RF ON sequence
- TIMBER data logging beyond DTL3
- DIAMON process monitor debugging
- RF Expert Inspector tools debugging / improvement

RF Deployment from RR

- Commissioning of the debuncher system (1st month)
- Commissioning of cavity loops v3 (1st month)

- Commissioning of the beam loading compensation: Kalmann Predictor and Adaptive Feed-forward (AFF)
- Automatic Reconditioning

- Monitoring, Testing, Debugging

- Work requires regular Technical Stops

Linac4 RF Organization

- Combined Effort of 4 Sections in the RF Group
  - Modulators and Klystrons (MK)
  - Feedbacks & Beam Control (FB)
  - Servos & Controls Interface (CS)
  - Linacs RF (LRF)
- Tight dependence also on the Modulator (TE-EPC)

- Some Interlocks are linked to specific service in charge
- Some require intervention and further analysis:
  - E.g. excess in reflected power on the klystron

System Level Debugging
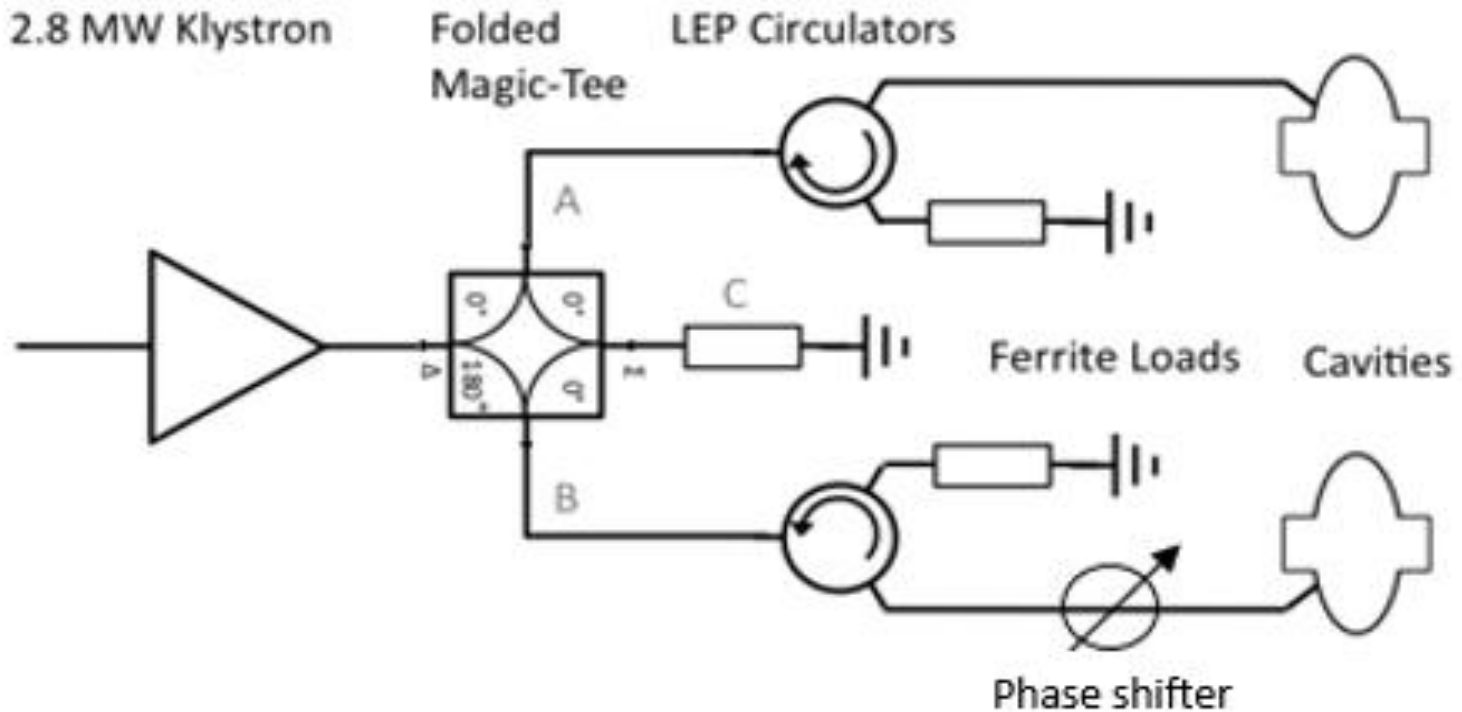
Linac Operations (tbd)

- Operation from CCC by **Operator**
- In case of problems -> Calls **Linac Supervisor**

- Analyses Issue, dispatch to **RF first line** (BE-LRF)
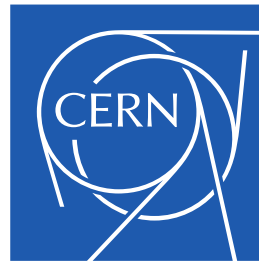- Analyses faulty RF system, dispatch to **RF Experts**

- Daytime Service through Linac RF 76645
- Best Effort Call-Out List during Daytime on Weekends
- Intervention by RF Experts during working hours
- RR is a unique opportunity to train future piquets

Linac Operation Issues

- Current RF applications are first line / expert tools
  - They are not meant for operators or supervisors
  - They are not sufficient for reliable operation

- Operation with 2 days MD, 2 weeks operation (or 3/3)

Primary goals for reliability run:

- Make sure that systems are fully compliant
- Find reliability issues
- Debug, debug, debug

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