ICFA mini-WORKSHOP ON IMPEDANCES AND BEAM INSTABILITIES IN PARTICLE ACCELERATORS

Report of Contributions

https://agenda.infn.it/e/12603

Contribution ID: **0** Type: **not specified**

Welcome and general introduction

Tuesday 19 September 2017 09:00 (30 minutes)

Presenter: PETRACCA, Stefania (SA)

Session Classification: Session 1- Introductory talks (Chair: Giovanni Rumolo)

Contribution ID: **1** Type: **not specified**

Impedance theory and modeling

Tuesday 19 September 2017 09:30 (30 minutes)

Author: Dr METRAL, Elias (CERN)

Presenter: Dr METRAL, Elias (CERN)

Session Classification: Session 1- Introductory talks (Chair: Giovanni Rumolo)

Contribution ID: **2** Type: **not specified**

Impedance measurement techniques

Tuesday 19 September 2017 10:00 (30 minutes)

Author: Dr NIEDERMAYER, Uwe (TU-Darmstadt)

Presenter: Dr NIEDERMAYER, Uwe (TU-Darmstadt)

Session Classification: Session 1- Introductory talks (Chair: Giovanni Rumolo)

Contribution ID: **3** Type: **poster**

Impedance Effects on Beam Dynamics in the 50 MeV ThomX Storage Ring

ThomX is a low energy Compton Backscattering Source (CBS) demonstrator which is being built at LAL, Orsay, France. As the 18 m storage ring has a design energy of 50 MeV, the electron beam is very sensible to collective effects. Furthermore the beam is extracted while a new one is injected every 20 ms, and the damping time is about 2 seconds. So the electron dynamics is not damped and the beam stability becomes a crucial matter. The impedance of all the storage ring components has been computed either by simulation, by RF measurement or by using an analytical model. The impedance effect on beam dynamics has been evaluated by tracking simulations using two different methods: the broad band resonator model and wake functions. ThomX impedance model and how the beam dynamics is affected will be shown in both cases.

Author: Mr GAMELIN, Alexis (Laboratoire de l'Accélérateur Linéaire (LAL))

Co-author: Dr BRUNI, Christelle (LAL)

Presenter: Mr GAMELIN, Alexis (Laboratoire de l'Accélérateur Linéaire (LAL))

Contribution ID: **4** Type: **not specified**

Electron cloud effects

Tuesday 19 September 2017 11:00 (30 minutes)

Author: Mr IADAROLA, Giovanni (CERN - Università di Napoli Federico II)

Presenter: Mr IADAROLA, Giovanni (CERN - Università di Napoli Federico II)

Session Classification: Session 1- Introductory talks (Chair: Giovanni Rumolo)

Contribution ID: **5** Type: **not specified**

Instability theory and modeling

Tuesday 19 September 2017 11:30 (30 minutes)

Author: Dr BOINE-FRANKENHEIM, Oliver (TU-darmstadt)

Presenter: Prof. BOINE-FRANKENHEIM, Oliver (Technische Universität Darmstadt)

Session Classification: Session 1- Introductory talks (Chair: Giovanni Rumolo)

Contribution ID: **6** Type: **not specified**

Instability observations and cures

Tuesday 19 September 2017 12:00 (30 minutes)

Author: Dr SHAPOSHNIKOVA, Elena (CERN)

Presenter: Dr SHAPOSHNIKOVA, Elena (CERN)

Session Classification: Session 1- Introductory talks (Chair: Giovanni Rumolo)

Contribution ID: **7** Type: **not specified**

Wakefields/impedances for a bunch moving between two corrugated plates

Tuesday 19 September 2017 14:30 (20 minutes)

Author: BANE, Karl (SLAC)

Presenter: BANE, Karl (SLAC)

Session Classification: Session 2 - Impedance theory and modeling (Chair: Ursula Van Rienen. Scientific secretary: Mario Beck)

Contribution ID: **8** Type: **not specified**

Calculation of wakefields for plasma-wakefield accelerators

Tuesday 19 September 2017 14:50 (20 minutes)

Author: Dr STUPAKOV, Gennady (SLAC)

Presenter: Dr STUPAKOV, Gennady (SLAC)

Session Classification: Session 2 - Impedance theory and modeling (Chair: Ursula Van Rienen. Scientific secretary: Mario Beck)

Contribution ID: **9** Type: **not specified**

Multi-physics simulations of impedance effects in accelerators

Tuesday 19 September 2017 16:20 (20 minutes)

Author: Dr ZANNINI, Carlo (ADAM)

Presenter: Dr ZANNINI, Carlo (ADAM)

Session Classification: Session 2 - Impedance theory and modeling (Chair: Ursula Van Rienen. Scientific secretary: Mario Beck)

Contribution ID: **10** Type: **not specified**

Advanced method of wakefield calculations (numerical methods, parallel computing)

Tuesday 19 September 2017 15:10 (20 minutes)

Author: Dr GJONAJ, Erion (TU-Darmstadt)

Presenter: Dr GJONAJ, Erion (TU-Darmstadt)

Session Classification: Session 2 - Impedance theory and modeling (Chair: Ursula Van Rienen. Scientific secretary: Mario Beck)

Contribution ID: **11** Type: **not specified**

Analytical impedance models for very short bunches

Tuesday 19 September 2017 15:30 (20 minutes)

Author: ZAGORODNOV, Igor (DESY)

Presenter: ZAGORODNOV, Igor (DESY)

Session Classification: Session 2 - Impedance theory and modeling (Chair: Ursula Van Rienen. Scientific secretary: Mario Beck)

Contribution ID: **12** Type: **not specified**

The concept of coupling impedance in the self-consistent plasma wake field excitation

Tuesday 19 September 2017 17:20 (20 minutes)

Author: Prof. FEDELE, Renato (Scuola Politecnica e delle Scienze di Base, Dipartimento di Fisica, Università di Napoli Federico II and INFN Sezione di Napoli, Napoli, Italy)

Presenter: Prof. FEDELE, Renato (Scuola Politecnica e delle Scienze di Base, Dipartimento di Fisica, Università di Napoli Federico II and INFN Sezione di Napoli, Napoli, Italy)

Session Classification: Session 2 - Impedance theory and modeling (Chair: Ursula Van Rienen. Scientific secretary: Mario Beck)

Contribution ID: **13** Type: **not specified**

Impedance Issues in the Design, Measurements, and Beam Commissioning of a Narrow Gap Stripline Kicker For On-Axis Injection

Tuesday 19 September 2017 16:40 (20 minutes)

Author: Dr DE SANTIS, Stefano (LBNL)

Presenter: Dr DE SANTIS, Stefano (LBNL)

Session Classification: Session 2 - Impedance theory and modeling (Chair: Ursula Van Rienen. Scientific secretary: Mario Beck)

Contribution ID: **14** Type: **not specified**

”The Birth and the Childhood of the Coupling Impedance and the Stability Maps” Special seminar to celebrate the 50 years of the beam coupling impedance concept

Tuesday 19 September 2017 17:40 (30 minutes)

Author: VACCARO, Vittorio Giorgio (NA)

Presenter: VACCARO, Vittorio Giorgio (NA)

Session Classification: Session 2 - Impedance theory and modeling (Chair: Ursula Van Rienen. Scientific secretary: Mario Beck)

Contribution ID: **21** Type: **not specified**

Needs and solutions for machine impedance reduction

Wednesday 20 September 2017 10:00 (20 minutes)

Author: Dr VOLLINGER, Christine (CERN)

Presenter: Dr VOLLINGER, Christine (CERN)

Session Classification: Session 3: Impedance modeling, measurements and control (Chair: Maria Rosaria Masullo. Scientific secretary: Andrea Passarelli)

Contribution ID: **22** Type: **not specified**

2D and 3D collimator impedance modelling and experimental measurements

Wednesday 20 September 2017 09:20 (20 minutes)

Author: Dr BIANCACCI, Nicolo (CERN)

Presenter: Dr BIANCACCI, Nicolo (CERN)

Session Classification: Session 3: Impedance modeling, measurements and control (Chair: Maria Rosaria Masullo. Scientific secretary: Andrea Passarelli)

Contribution ID: **23** Type: **not specified**

Challenges and pitfalls for impedance measurements in the lab

Wednesday 20 September 2017 09:00 (20 minutes)

Author: MOSTACCI, Andrea (ROMA1)

Presenter: MOSTACCI, Andrea (ROMA1)

Session Classification: Session 3: Impedance modeling, measurements and control (Chair: Maria Rosaria Masullo. Scientific secretary: Andrea Passarelli)

Contribution ID: **24** Type: **not specified**

Beam measurements of frequency characteristics of (longitudinal) impedance

Wednesday 20 September 2017 10:50 (20 minutes)

Author: Dr LASHEEN, Alexandre (CERN)

Presenter: Dr LASHEEN, Alexandre (CERN)

Session Classification: Session 3: Impedance modeling, measurements and control (Chair: Maria Rosaria Masullo. Scientific secretary: Andrea Passarelli)

Contribution ID: **27** Type: **not specified**

Beam-based impedance measurement techniques in light sources

Wednesday 20 September 2017 11:10 (20 minutes)

Author: Dr NAGAOKA, Ryutaro (Soleil)

Presenter: Dr NAGAOKA, Ryutaro (Soleil)

Session Classification: Session 3: Impedance modeling, measurements and control (Chair: Maria Rosaria Masullo. Scientific secretary: Andrea Passarelli)

Contribution ID: **28** Type: **not specified**

An improved method to measure beam impedance with rotating wire. Theoretical and simulation results

Wednesday 20 September 2017 12:10 (20 minutes)

Author: Mr BERRIG, Olav (CERN)

Presenter: Mr BERRIG, Olav (CERN)

Session Classification: Session 3: Impedance modeling, measurements and control (Chair: Maria Rosaria Masullo. Scientific secretary: Andrea Passarelli)

Contribution ID: **29** Type: **not specified**

Precise impedance determination from simultaneously measured tunes of unequal charge bunches

Wednesday 20 September 2017 11:50 (20 minutes)

Author: Dr PODOBEDOV, Boris (Brookhaven National Laboratory)

Presenter: Dr PODOBEDOV, Boris (Brookhaven National Laboratory)

Session Classification: Session 3: Impedance modeling, measurements and control (Chair: Maria Rosaria Masullo. Scientific secretary: Andrea Passarelli)

Contribution ID: **30** Type: **not specified**

Eigenmode Computations for Chains of Cavities

Tuesday 19 September 2017 17:00 (20 minutes)

Author: FLISGEN, Thomas (Helmholtz Zentrum Berlin)

Presenter: FLISGEN, Thomas (Helmholtz Zentrum Berlin)

Session Classification: Session 2 - Impedance theory and modeling (Chair: Ursula Van Rienen. Scientific secretary: Mario Beck)

Contribution ID: **32** Type: **not specified**

Role of space charge in coherent instabilities

Thursday 21 September 2017 09:00 (20 minutes)

Author: Dr BLASKIEWICZ, Mike (BNL)

Presenter: Dr BLASKIEWICZ, Mike (BNL)

Session Classification: Session: 4: Instability theory and modeling (Chair: Ingo Hofmann. Scientific secretary: Adrian Oeftiger)

Contribution ID: **33** Type: **not specified**

Microbunching instability

Thursday 21 September 2017 10:00 (20 minutes)

Author: Dr RATNER, Daniel (SLAC)

Presenter: Dr RATNER, Daniel (SLAC)

Session Classification: Session: 4: Instability theory and modeling (Chair: Ingo Hofmann. Scientific secretary: Adrian Oeftiger)

Contribution ID: **34** Type: **not specified**

Chromaticity effects on head-tail instabilities for broad-band impedance using two particle model, Vlasov analysis, and simulations

Thursday 21 September 2017 09:20 (20 minutes)

Author: Dr CHIN, Yong Ho (KEK)

Presenter: Dr CHIN, Yong Ho (KEK)

Session Classification: Session: 4: Instability theory and modeling (Chair: Ingo Hofmann. Scientific secretary: Adrian Oeftiger)

Contribution ID: **35** Type: **not specified**

Modeling of fast beam ion instabilities

Thursday 21 September 2017 11:30 (20 minutes)

Author: METHER, Lotta (EPFL)

Presenter: METHER, Lotta (EPFL)

Session Classification: Session: 4: Instability theory and modeling (Chair: Ingo Hofmann. Scientific secretary: Adrian Oeftiger)

Contribution ID: **37** Type: **not specified**

Circulant matrix formalism, benchmarks and beam-beam effect in coherent instabilities

Thursday 21 September 2017 10:50 (20 minutes)

Author: Dr BUFFAT, Xavier (CERN)

Presenter: Dr BUFFAT, Xavier (CERN)

Session Classification: Session: 4: Instability theory and modeling (Chair: Ingo Hofmann. Scientific secretary: Adrian Oeftiger)

Contribution ID: **38** Type: **not specified**

Coherent head-tail instability in collision with a large crossing angle

Presenter: Dr OHMI, Kazuhito Ohmi (KEK)

Contribution ID: **39** Type: **not specified**

Longitudinal and transverse ions cloud dynamics in an electron ring in presence of electromagnetic fields and gaps

Thursday 21 September 2017 11:50 (20 minutes)

Author: Mr GAMELIN, Alexis (Laboratoire de l'Accélérateur Linéaire (LAL))

Presenter: Mr GAMELIN, Alexis (Laboratoire de l'Accélérateur Linéaire (LAL))

Session Classification: Session: 4: Instability theory and modeling (Chair: Ingo Hofmann. Scientific secretary: Adrian Oeftiger)

Contribution ID: **40** Type: **not specified**

Mitigation of collective effects by optics optimization and the SPS experience

Thursday 21 September 2017 14:00 (20 minutes)

Author: Mr BARTOSIK, Hannes (CERN)

Presenter: Mr BARTOSIK, Hannes (CERN)

Session Classification: Session 5: Instability modeling, observations and cures (Chair: Mikhail Zobov. Scientific secretary: Eleonora Belli

Contribution ID: **43** Type: **not specified**

Transverse feedback systems for multi-bunch beam diagnostics and instabilities suppression

Thursday 21 September 2017 16:30 (20 minutes)

Author: DRAGO, Alessandro (LNF)

Presenter: DRAGO, Alessandro (LNF)

Session Classification: Session 5: Instability modeling, observations and cures (Chair: Mikhail Zobov. Scientific secretary: Eleonora Belli

Contribution ID: **44** Type: **not specified**

Codes benchmarking for the single-bunch instabilities in electron storage rings

Thursday 21 September 2017 16:10 (20 minutes)

Author: Dr XU, Haisheng (Institute of High Energy Physics of Chinese Academy of Scineces)

Presenter: Dr XU, Haisheng (Institute of High Energy Physics of Chinese Academy of Scineces)

Session Classification: Session 5: Instability modeling, observations and cures (Chair: Mikhail Zobov. Scientific secretary: Eleonora Belli

Contribution ID: **45** Type: **not specified**

Vlasov solvers and macroparticle simulations

Thursday 21 September 2017 15:50 (20 minutes)

Author: Dr MOUNET, Nicolas (EPFL)

Presenter: Dr MOUNET, Nicolas (EPFL)

Session Classification: Session 5: Instability modeling, observations and cures (Chair: Mikhail Zobov. Scientific secretary: Eleonora Belli

Contribution ID: **52** Type: **not specified**

Closing remarks of Session 2: Impedance theory and modeling

Friday 22 September 2017 13:30 (15 minutes)

Author: VAN RIENEN, Ursula (uni Rostock)

Presenter: VAN RIENEN, Ursula (uni Rostock)

Session Classification: Session 7: Conclusions (Chair: Stefania Petracca)

Contribution ID: **53** Type: **not specified**

Closing remarks of Session 3: Impedance measurements and control

Friday 22 September 2017 13:45 (15 minutes)

Author: MASULLO, Maria Rosaria (NA)

Presenter: MASULLO, Maria Rosaria (NA)

Session Classification: Session 7: Conclusions (Chair: Stefania Petracca)

Contribution ID: **54** Type: **not specified**

Closing remarks of Session 4: Instability theory and modeling

Friday 22 September 2017 14:00 (15 minutes)

Author: Prof. HOFMANN, Ingo (GSI Darmstadt)

Presenter: Prof. HOFMANN, Ingo (GSI Darmstadt)

Session Classification: Session 7: Conclusions (Chair: Stefania Petracca)

Contribution ID: **55** Type: **not specified**

Closing remarks of Session 5: Instability modeling, observations and cures

Friday 22 September 2017 14:15 (15 minutes)

Author: ZOBOV, Mikhail (LNF)

Presenter: ZOBOV, Mikhail (LNF)

Session Classification: Session 7: Conclusions (Chair: Stefania Petracca)

Contribution ID: **56** Type: **not specified**

Closing remarks, acknowledgements and goodbye

Friday 22 September 2017 14:30 (15 minutes)

Author: Dr RUMOLO, Giovanni (CERN)

Presenter: Dr RUMOLO, Giovanni (CERN)

Session Classification: Session 7: Conclusions (Chair: Stefania Petracca)

Contribution ID: **70** Type: **oral**

Conclusions

This contribution will be the workshop closure with general conclusions from the experience, acknowledgement of participants and farewell

Author: Dr RUMOLO, Giovanni (CERN)

Contribution ID: **84** Type: **not specified**

Wide-band feedback systems to diagnose and suppress intra-bunch motion in accelerators

Thursday 21 September 2017 16:50 (20 minutes)

Author: Prof. FOX, John (SLAC)

Presenter: FOX, John

Session Classification: Session 5: Instability modeling, observations and cures (Chair: Mikhail Zobov. Scientific secretary: Eleonora Belli

Contribution ID: **85** Type: **not specified**

TMCI at strong space charge

Thursday 21 September 2017 09:40 (20 minutes)

Author: Dr ZOLKIN, Timofey (Fermi National Accelerator Laboratory)

Presenter: Dr ZOLKIN, Timofey (Fermi National Accelerator Laboratory)

Session Classification: Session: 4: Instability theory and modeling (Chair: Ingo Hofmann. Scientific secretary: Adrian Oeftiger)

Contribution ID: **86** Type: **not specified**

Observation and active damping of longitudinal coupled bunch instabilities

Thursday 21 September 2017 14:40 (20 minutes)

Author: DAMERAU, Heiko (CERN)

Presenter: DAMERAU, Heiko (CERN)

Session Classification: Session 5: Instability modeling, observations and cures (Chair: Mikhail Zobov. Scientific secretary: Eleonora Belli

Contribution ID: **93** Type: **not specified**

Continuous-Wave HOM Load Power Computations Based on Single-Bunch Wake Simulations

Wednesday 20 September 2017 09:40 (20 minutes)

Author: GLOCK, Hans-Walter (FG-ISRF)

Presenter: GLOCK, Hans-Walter (FG-ISRF)

Session Classification: Session 3: Impedance modeling, measurements and control (Chair: Maria Rosaria Masullo. Scientific secretary: Andrea Passarelli)

Contribution ID: **94** Type: **not specified**

Simulation of longitudinal intensity effects with LLRF system (BLonD)

Thursday 21 September 2017 14:20 (20 minutes)

Author: Dr TIMKO, Helga (CERN)

Presenter: Dr TIMKO, Helga (CERN)

Session Classification: Session 5: Instability modeling, observations and cures (Chair: Mikhail Zobov. Scientific secretary: Eleonora Belli

Contribution ID: **95** Type: **not specified**

Challenges in impedance and instabilities computation for new generation light sources

Thursday 21 September 2017 15:00 (20 minutes)

Author: PERSICHELLI, Serena

Presenter: PERSICHELLI, Serena

Session Classification: Session 5: Instability modeling, observations and cures (Chair: Mikhail Zobov. Scientific secretary: Eleonora Belli

Contribution ID: **96** Type: **not specified**

Damping of transverse instabilities

Friday 22 September 2017 09:00 (20 minutes)

Author: Dr KORNILOV, Vladimir (GSI Helmholtzzentrum)

Presenter: Dr KORNILOV, Vladimir (GSI Helmholtzzentrum)

Session Classification: Session 6 -Instability modeling, observations and cures (Chair: Mikhail Zobov, Scientific secretary: Andrea Passarelli)

Contribution ID: **97** Type: **not specified**

Concept and simulations of unconventional damping devices: wideband damper and RFQ

Friday 22 September 2017 09:20 (20 minutes)

Author: Dr LI, Kevin (CERN)

Presenter: Dr LI, Kevin (CERN)

Session Classification: Session 6 -Instability modeling, observations and cures (Chair: Mikhail Zobov, Scientific secretary: Andrea Passarelli)

Contribution ID: **98** Type: **not specified**

A study of longitudinal effects on transverse Landau damping

Friday 22 September 2017 09:40 (20 minutes)

Author: Prof. HOFMANN, Ingo (GSI Darmstadt)

Presenter: Prof. HOFMANN, Ingo (GSI Darmstadt)

Session Classification: Session 6 -Instability modeling, observations and cures (Chair: Mikhail Zobov, Scientific secretary: Andrea Passarelli)

Contribution ID: **99** Type: **not specified**

Beam Transfer Function (BTF) measurements and transverse stability in presence of beam-beam

Friday 22 September 2017 10:00 (20 minutes)

Author: Ms TAMBASCO, Claudia (EPFL, Lausanne, Switzerland)

Presenter: Ms TAMBASCO, Claudia (EPFL, Lausanne, Switzerland)

Session Classification: Session 6 -Instability modeling, observations and cures (Chair: Mikhail Zobov, Scientific secretary: Andrea Passarelli)

Contribution ID: **101** Type: **not specified**

Impedance and instabilities in lepton colliders

Friday 22 September 2017 10:50 (20 minutes)

Author: MIGLIORATI, Mauro (ROMA1)

Presenter: MIGLIORATI, Mauro (ROMA1)

Session Classification: SPECIAL SESSION: Overview on different types of machines (Chair: Chris Prior, Scientific Secretary: Adrian Oeftiger)

Contribution ID: **102** Type: **not specified**

Impedance and instabilities in hadron machines

Friday 22 September 2017 11:10 (20 minutes)

Author: SALVANT, Benoit (CERN)

Presenter: SALVANT, Benoit (CERN)

Session Classification: SPECIAL SESSION: Overview on different types of machines (Chair: Chris Prior, Scientific Secretary: Adrian Oeftiger)

Contribution ID: **103** Type: **not specified**

Impedance modeling in low emittance rings

Friday 22 September 2017 11:30 (20 minutes)

Author: Dr BLEDNYKH, Alexei (BNL)

Presenter: Dr BLEDNYKH, Alexei (BNL)

Session Classification: SPECIAL SESSION: Overview on different types of machines (Chair: Chris Prior, Scientific Secretary: Adrian Oeftiger)

Contribution ID: **104** Type: **not specified**

Instabilities in hadron colliders and role of the transverse damper

Friday 22 September 2017 11:50 (20 minutes)

Author: Dr BUROV, Alexey (Fermilab)

Presenter: Dr BUROV, Alexey (Fermilab)

Session Classification: SPECIAL SESSION: Overview on different types of machines (Chair: Chris Prior, Scientific Secretary: Adrian Oeftiger)

Contribution ID: **110** Type: **not specified**

Comparison of machine impedance calculation with beam based measurements

Wednesday 20 September 2017 11:30 (20 minutes)

Author: BANE, Karl (SLAC)

Presenter: BANE, Karl (SLAC)

Session Classification: Session 3: Impedance modeling, measurements and control (Chair: Maria Rosaria Masullo. Scientific secretary: Andrea Passarelli)

Contribution ID: **111** Type: **not specified**

How e-cloud in dipoles and quadrupoles can be source of transverse instabilities

Thursday 21 September 2017 11:10 (20 minutes)

Author: Ms ROMANO, Annalisa (CERN)

Presenter: Ms ROMANO, Annalisa (CERN)

Session Classification: Session: 4: Instability theory and modeling (Chair: Ingo Hofmann. Scientific secretary: Adrian Oeftiger)

Contribution ID: **113** Type: **poster**

Preliminary results from validation measurements of the longitudinal power deposition model for the LHC injection kicker magnet

Thursday 21 September 2017 18:00 (20 minutes)

The MKIs are fast pulsed transmission line injection kicker magnets of the LHC injection system. To shield the ferrite yoke from the beam, by providing a path for the beam image current, a set of 24 conductive wires is placed in the inner part of a ceramic tube along the length of the magnet aperture. Stringent rise-time specifications require that the wires are capacitively coupled to a grounded metallic cylinder at the upstream end of the tube, while at the downstream end they can be directly grounded. The cylinder also serves to support a set of nine ferrite rings, placed there to damp low frequency modes that can be excited along the length of the tube. Due to the beam screen design, an open-ended, half-wavelength resonating cavity is formed in the region where the screen conductors overlap with the external metallic cylinder. The so-formed cavity couples to the beam spectrum at discrete frequencies, determined by the length and effective dielectric constant of the cavity. Therefore, the impedance spectrum is resonant in nature exhibiting peaks at the cavity's resonant frequencies.

In order to ensure uninterrupted LHC operation, the MKI ferrite yokes must remain below their Curie temperature at all times. Otherwise, waiting for the yokes to cool down leads to long turn-around times and hence significant deterioration of the overall machine performance. To monitor the temperatures reached within the MKIs 4 thermal probes (PT100) are placed in each magnet: two probes at the upstream and two at the downstream end of the magnet. During Run 1 of the LHC, one of the MKIs occasionally exhibited a high ferrite temperature. An impedance mitigation campaign was launched prior to Long Shutdown 1 (LS1) that led to an effective reduction of the MKI beam coupling impedance and to the corresponding RF heating during Run 2. However, thermal measurements during operation have clearly demonstrated that the upstream end of the magnet is consistently hotter than the downstream one. Power deposition caused by beam induced electromagnetic (e/m) fields due to the coupling of the beam spectrum to the MKI real longitudinal impedance, was identified as the main cause. Nonetheless, the simplified approach of a uniformly distributed power deposition along the length of the magnet was in clear contradiction with the measured data. Therefore, a more detailed description of the power dissipation process had to be looked for and carefully modelled to allow for accurate and robust predictions of current and future kicker beam screen designs; e.g. for HL-LHC.

In the present work, the approach followed to obtain estimations for the power loss deposition distributions is presented in detail. The method utilizes sophisticated electromagnetic simulations combined with carefully designed data post-processing to minimize the required simulation data, thus leading to acceptable execution time and storage space per simulation. The method, is then applied to two beam screen designs of the MKI: the one currently in operation and a new one, to be installed as an upgraded version in YETS 17/18. A comparison of the expected power deposition distributions is then carried out and the results are discussed. To validate the predictions of the power deposition model and gain more confidence in the effectiveness of the proposed design, a novel measurement method is proposed and implemented. The method is based on a simple measurement of a transmission coefficient taking advantage of the configuration of the expected e/m modes responsible for RF-heating. Preliminary results of the power deposition measurements are then reported and compared to model predictions.

Presenter: Mr VLACHODIMITROPOULOS, Vasileios (CERN)

Session Classification: POSTER session