

High  
Luminosity  
LHC



# Organisation of beam-beam and luminosity activities

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Beam-beam and luminosity meeting

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# Activities

- Theory
- Simulations
- Experiments
- Operation

- Beam-beam studies
  - Weak-strong (non-linear dynamics)
    - Impact of beam-beam in linear and non-linear dynamics (DA) at collision
    - Compensation
      - Crossing schemes
      - Long range compensation (wire, e-lense)
  - Strong-strong
    - Noise
    - Relation with impedance and instabilities
- Luminosity modeling and optimisation
  - Beam distribution evolution during the cycle
    - Intrabeam (and Touschek) scattering
    - Non-linear effects including Beam-beam
    - Noise

- LHC
- HL-LHC
- FCC

# Organisation



- Beam-beam studies (weekly) meetings
  - Discussion within collaborating groups and sections
    - ABP-HSS, ABP-HSC, ABP-LAT
    - OP-LHC
    - BI
    - RF-BR, RF-FB
  - Reporting results to relevant committees
    - LBOC
    - WP2 TL meetings, HL-LHC PLC and TC
    - FCC-hh design meetings, FCC-ee accelerator meetings

# People – CERN Staff



- Y. Papaphilippou (ABP-LAT)
  - Activity coordination, Weak-strong, Beam-beam effects in HL-LHC, luminosity modeling
- T. Pieloni (ABP-HSC)
  - LHC beam-beam studies for run II, HL-LHC pacman effects (TRAIN), contact with EPFL
    - Two beam stability, operational setting-up (IPs), observations and MDs
- X. Buffat (ABP-LAT)
  - Interplay between beam-beam and impedances in the LHC and HL-LHC, Beam-beam effects in FCC-hh
- G. Papotti (OP-LHC)
  - LHC operation, luminosity observations
- ...and in the future
  - G. Iadarola (ABP-HSC)
    - Weak-strong

# People – Fellows, associates and students



- F. Antoniou (ABP-LAT)
  - Intrabeam scattering, Luminosity modeling
- J. Alabau-Gonzalvo (ABP-LAT)
  - BBLR compensation in HL-LHC
- A. Patapenka (ABP-LAT)
  - BBLR compensation, SIXTRACK implementation and simulations for LHC tests
- S. Papadopoulou (ABP-LAT)
  - Intrabeam Scattering simulations
- K. Skoufaris (ABP-LAT)
  - Symplectic integrator implementation, lifetime simulations
- L. Gonzalez (ABP-LAT)
  - Luminosity data analysis
- ...and in the future
  - F. Asvesta (ABP)
    - Wire experiment in the SPS and LHC

Supervised by  
Y. Papaphilippou

# People – Fellows, associates and students



- J. Barranco Garcia (ABP-HSC)
  - Sixtrack 6D lens and CC implementation, noise studies
- C. Tambasco (ABP-HSC)
  - Beam-beam strong-strong simulations and measurements
- A. Esmail and A. Florio (EPFL)
  - EPFL diploma students

Supervised by  
T. Pieloni

- M. Hostettler (OP-LHC)
  - Luminosity observations and modelling

Supervised by  
G. Papotti

# People – external collaborators



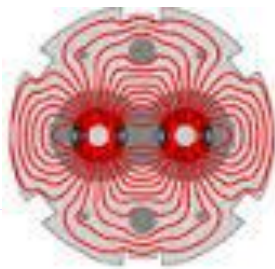
- S. Valishev (FNAL)
  - HL-LHC beam-beam studies task leader, BBLR compensation
- G. Stancari (FNAL)
  - E-lens and halo simulations
- Y. Alexahin (FNAL)
  - Instabilities and beam-beam
- J. Qiang (LBNL)
  - Strong-strong BB simulations, noise effects
- D. Shatilov (BINP)
  - Lifetrac simulations
- M. Crouch (CI and Un. of Manchester)
  - Beam-beam studies for HL-LHC
- ...and in the future
  - D. Kalchev (TRIUMF)
    - Beam-beam weak strong simulations

# People – other CERN contacts



- G. Arduini, E. Metral, M. Giovannozzi (ABP)
  - ABP management, interface with collective effects and single particle effect studies
- R. de Maria, M. Fitterer (ABP)
  - Sixtrack interface, noise studies
- H. Schmickler, R. Jones, T. Lefevre, G. Trad (BI)
  - BBLR compensation project, tests in LHC and SPS, Interface with beam instrumentation
- A. Rossi (ABP)
  - BBLR compensation integration, interface with collimation
- W. Hoffle, D. Valuch, P. Baudrenghien, E. Shaposhnikova, R. Calaga (RF)
  - Noise studies, Crab cavities, interface with RF beam studies
- J. Wenninger, M. Pojer, B. Salvachua, M. Solfaroli (OP-LHC)
  - OP contacts, beam-beam MDs
- D. Schulte, F. Zimmermann (ABP)
  - Interface with FCC
- E. MacIntosh, F. Schmidt (ABP)
  - Interface with LHC@home





# Thank you

