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# HOM Issues in the ESS SC linac

Stephen Molloy  
22nd September, 2011  
ESS, Lund



# Accelerator Design Update



Romuald Duperrier  
(30 years ago)



Steve Peggs



Cristina Oyon



Josu Eguia

## Work Package (work areas)

1. Management Coordination – ESS (Mats Lindroos)

2. Accelerator Science – ESS (Steve Peggs)

3. Infrastructure Services – Tekniker, Bilbao (Josu Eguia)

4. SCRF Spoke cavities – IPN, Orsay (Sebastien Bousson)

5. SCRF Elliptical cavities – CEA, Saclay (Guillaume Devanz)

6. Front End and NC linac – INFN, Catania (Santo Gammino)

7. Beam transport, NC magnets and Power Supplies – Århus University (Søren Pape-Møller)

8. RF Systems – Uppsala university (Roger Ruber)



Mats Lindroos



Guillaume Devanz



Roger Ruber



Søren Pape Møller



Santo Gammino

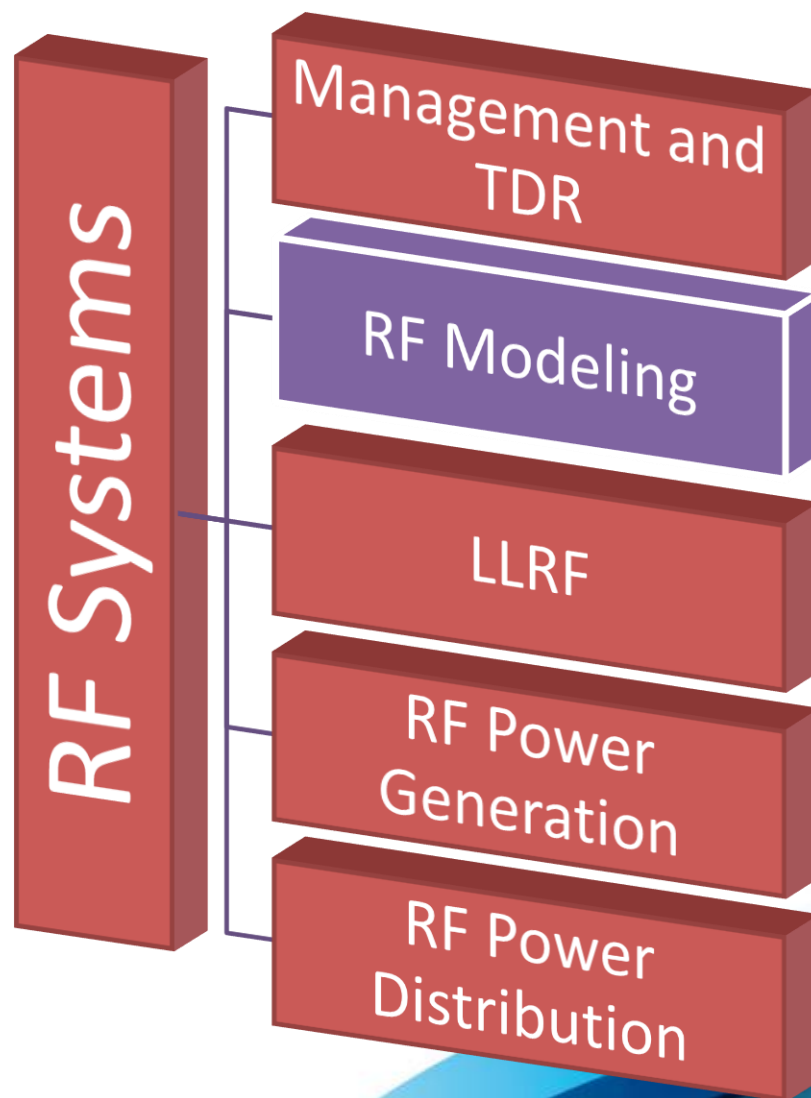


Sebastien Bousson





# Work Package 8: RF Systems



# Open questions

- Beam loss limit
  - 1 W/m maximum loss
    - Based on cryo-load, and radioactivation of the beamline
  - Beam dynamics
    - Influence of the HOMs
    - Halo (longitudinal and transverse)
- Field emission / Multipacting (FE/MP)
  - Q reduction
  - Cryoload
  - HOM coupler detuning

# One common question?

- Install HOM coupler(s)? Or not?
- Benefits:
  - Beam dynamics
  - Cryoload
  - Diagnostics
- Risks:
  - FE/MP
    - Can cavity/coupler be cleaned/processed to negate this?
  - Complexity/cost of cavity & cryomodule
- Many “open questions” for RF modeling are influenced by the HOM coupler question

# Goals

- Understand what work has already been done
  - Can any of my questions be answered today/tomorrow?
- Build a prioritised list of future work
  - Simulation
    - In-house, or collaboration partners
    - Choice of software tools
  - Experiment
    - Test stands
      - Uppsala, CERN, Saclay, (Lund?), ...
    - Operational beamlines
      - SNS, FLASH, ...

# Meeting organisation

- Presentation schedule is a guide
  - I hope this meeting is a discussion, not a series of seminars!
    - Conveners: Please don't be too rigid with the time 😊
- Thursday:
  - Majority of presentations, and beginning of discussions
- Friday:
  - Formulation of answers (and more questions...)
- *Lunch today at 12:00 at Kulturen*
  - *Across the street from here*
- *Dinner at 20:00 at M.E.A.T. (!)*
  - *Please indicate your preferred meal*





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Thanks in advance to everyone for taking time to attend and/or present their work!