

# Report on the 26th meeting of the GT-RF

April 2021

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# Meetings

- No informal meeting at last CPEM
- Meeting on April 7: 43 registrations

# Meeting agenda

- Chairman's report of development since the last meeting
- Comparisons (next slides)
- KCDB 2.0 update (Susanne Picard)
- GT-RF Chairmanship: candidates welcome
- Next meeting: informal, possibly online in 1 year

# Completed Comparisons

None

# Comparisons in progress 1/4

- CCEM.RF-K5c.CL: S-parameter PC-3.5 mm (NMIJ)
  - Measurements in progress since 2012
  - Severe delays, partly due to shipping
  - Draft A under review by participants
  - Issues
    - Insufficient communication of pilot
    - Analysis does not link the two loops
    - 5 laboratories have withdrawn

# Comparisons in progress 2/4

- CCEM.RF-K26: Attenuation in PC-2.4 mm, up to 40 GHz and 90dB (NMIJ)
  - Measurements 2015 – 2018
  - Delays due to shipping problems
  - Delay in preparing report because responsible person was assigned to another department within NMIJ.
  - Draft A submitted to support group April 2021

# Comparisons in progress 3/4

- CCEM.RF-K27.W: Power in WR15, 50 – 75 GHz (NIM)
  - Measurements started in 2019
  - Delay w.r.t. to protocol: 5 months
  - NMIJ added to participants
  - Final measurements underway (NMIJ, NIM)

# Comparisons in progress 4/4

- Pilot study on material properties
  - Final measurements by pilot underway
  - Report to be expected in May 2021



# Planned comparisons 1/3

- S-Parameters, 2.4 mm up to 50 GHz (METAS)
  - CMI, INRIM, INTA, KRISS, LNE, METAS, NIM, NIST, NMC A\*STAR, NMCC, NPL, NRC, PTB, RISE, SNIIM, UME and VSL
  - Collapsing star type comparison
  - Analysis of full data set (all frequency points)
  - Technical protocol under review
  - Measurements expected to start early 2022

# Planned comparisons 2/3

- Antenna comparison (gain and secondary parameters)
  - Interest by AIST, KRISS, NIST, NPL
  - Frequency bands under discussion: WR-03 (220 GHz to 325 GHz), WR-05 (140 GHz to 220 GHz), WR-06 (110 GHz to 170 GHz)
  - Pilot still needs to be found
  - NIST will coordinate further discussions by email

# Planned comparisons 3/3

- Field strength (gain and secondary parameters)
    - Several NMIs interested
    - Interest depending on frequency range
    - Option to include secondary quantities (e.g. magnetic field strength)
- NPL will make further evaluations and coordinate discussion by email

# Ideas for new comparisons 1/5

- Noise
  - Two options discussed
    - Waveguide WR28 (26.5 – 40 GHz): only NIM and NIST
    - Coaxial 3.5 mm (up to 26.5 GHz): INTA, KRISS, METAS, NIST, UME

→ METAS/NIST to propose further course of action

# Ideas for new comparisons 2/5

- RF Power (follow-up to K17)
  - Using new type of thermoelectric sensors (replacing thermistor mounts as primary standards)
  - Interest by several labs
  - NIST to coordinate discussion

# Ideas for new comparisons 3/5

- Attenuation (follow-up to K26)

- Different options discussed

- >100 GHz
- Waveguide

→ Interested laboratories to contact NPL, which will coordinate discussion

# Ideas for new comparisons 4/5

- S-parameter in waveguide
    - Suggested by CMI
    - Interest by several labs
    - Possibly conducted parallel to planned 2.4 mm comparison
- CMI to coordinate further discussion

# Ideas for new comparisons 5/5

- S-parameter on planar structures
  - Suggested by VSL
  - So far only PTB with CMC entry, but others might follow
  - Measurements are expected to become increasingly important
  - NMIs inform chairman about their future plans for on-wafer CMCs