Report on the 26th meeting of the GT-RF

April 2021

M. Zeier
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    • 5 laboratories have withdrawn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