Railway.noise @ ÖBB: what’s next?

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Railway noise @ ÖBB – what have we got?

- **IM**
  - **noise barriers**: 906 km (2018), new lines also with noise protection dams (55 km)
  - **NDTAC**: since 12/2017, corresponding Regulation (EU) No 2015/429,
    → within one year: +47% of retrofitted wagon-km (Jan 2017 and Jan 2018)
  - rail noise @ curves: **flange lubrication** individual, **railhead conditioning** under testing
  - a set of noise abatement methods - **BUT**: no rail dampers in use – because of
    - operational issues (→ digitised inspection of track not possible – needed 2-4 times p.a.)
    - safety issues (→ danger of crack of railhead at curves), corrugation quickly in curves
    - perception issues (→ perception of noise level difference depends on frequency,
      results see e.g. Kasess et. al. at inter.noise 2015, in german: ETR 3/2015, p64ff.)

- **RU**
  - **passenger** (ÖBB-PV): all coaches disc braked (no coaches with brake blocks in permanent operation since 2015), new EMU/DMU since 1990s disc braked
  - **freight** (RCW): >50% silent wagons (2/2019), nearly 30% of these LL retrofitted
Railway.noise @ ÖBB – what’s coming?

- **IM**
  - **noise barriers** at existing lines (to be buildt): finalized up to early 2020s
  - **new (main) lines** to be opened in the 2020s: southern line; Brenner base tunnel
  - **ongoing** testing and Research&Development (R&D) → see long term issues

- **RU**
  - **passenger** (ÖBB-PV):
    - **ongoing** vehicle procurement – replace older vehicles (EMU) by new, NOI TSI compliant ones
    - noise of parked trains – implement energy-saving mode for fans
  - **freight** (RCW): **retrofitting programme**, up to end 2020: >7500 wagons retrofitted
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- remember cornerstones:
  
  - framework: silent and more silent…END (incl. (EU) 2015/996), WHO, NOI TSI, …
  - but: achievable?
    - technically possible? – which solution(s), which part(s) of the system railway? at which location/vehicle?
    - which costs? - not only invest cost, also re-invest and additional maintenance- and operation complications (complete LCC of whole system)
    - → cost-benefit analysis – BUT:
      - benefit often not for IM/RU (e.g. public health),
      - to be in line with transport policy goals (e.g. White Paper of EC with target values for modal shift towards railways)
  
  - → demand for further systematic investigation(s) of whole system ‘railway’
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- demand for systematic investigation(s) - research

  - e.g. ERRAC-roadmap for railway noise research (2011):
    → to be updated?

    - infrastructure
    - vehicle-infrastructure-dynamics
    - OTMs (On-Track-Machines)

  - Meantime: no rest – also in future highest benefit for freight trains@night
    - R&D-project „LowNoiseTrain2“ (2018-20)
    - identification of noise sources and best-practice-construction style for freight wagons by measurements with acoustic camera
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- **LNT2: test train** (K/LL and Cl-brake block wagons)
  measurement with acoustic camera (120 micro's → e.g. >360 Mio.datasets/s (quality: one-third octave band), >1GB raw data per pass-by) & new pass-by-module for visualization ("under construction")
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- **LNT2-campaign: frequency location** – e.g. block train with 40 silent wagons of same type (‘Eaos’)

  ![Graph showing frequency location](image)

  **here:** @315Hz
  
  for all wagons passing by
  
  (image as example!)
thank you – for listening

and, any questions…?

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