



RAILWAY NOISE TECHNICAL MEASURES CATALOGUE

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8th UIC Railway
Noise
Workshop

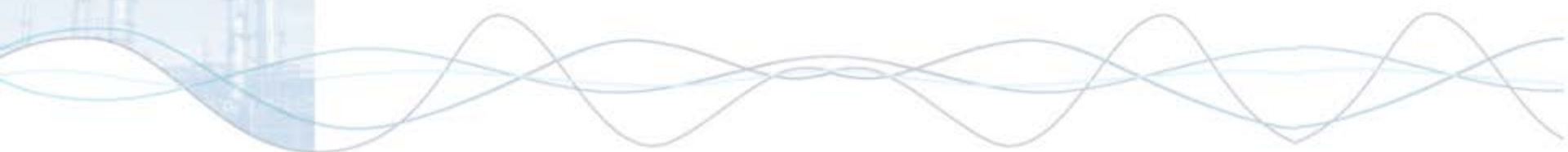
11 June 2013
Paris, UIC Headquarters

Frank Elbers and Edwin Verheijen

June 11, 2013

13:45 - 14:00

- The process of making the catalogue
- The chapters in the catalogue
 - introduction
 - curve squeal noise
 - noise from freight marshalling yards
 - noise from switches
 - other noise sources
- Final remarks





One subject per chapter

Each chapter contains:

- Executive summary
- Introduction
- Technical Description
- Infrastructure measures
- Rolling stock measures
- Practical experience with control measures
- List of manufacturers of products

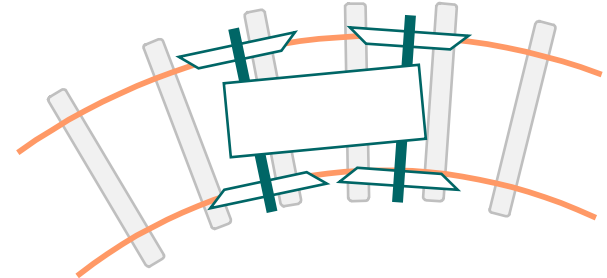
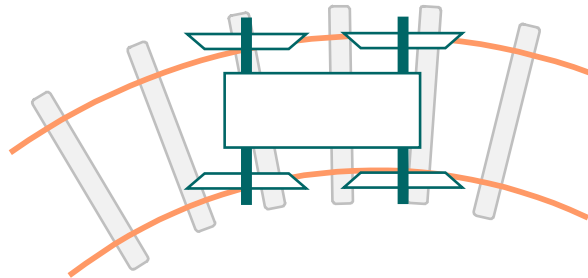
- Collecting technical and scientific articles and papers on railway noise solutions:
 - UIC Railway Noise Workshops
 - IWRN, WCRR, Inter-Noise, Euro-Noise
 - Research project: KP 2, EuropeTrain, STARDAMP,...
- Discussions with UIC core group (January - May 2013)
- Information from telephone interviews with various railway noise experts:

Bernd Asmussen (DB)
Bohumír Trávníček (SZDC)
Brigita Altenbaher (Elpa)
Chris Jones (UK)
Dave Anderson (RailCorp)
David Thompson (ISVR)
Eduard Verhelst (Infrabel)
Erkki Poikolainen (FTA)
Ferat Göçmen (DB)
Franck Poisson (SNCF)
Frans Slat (NS)

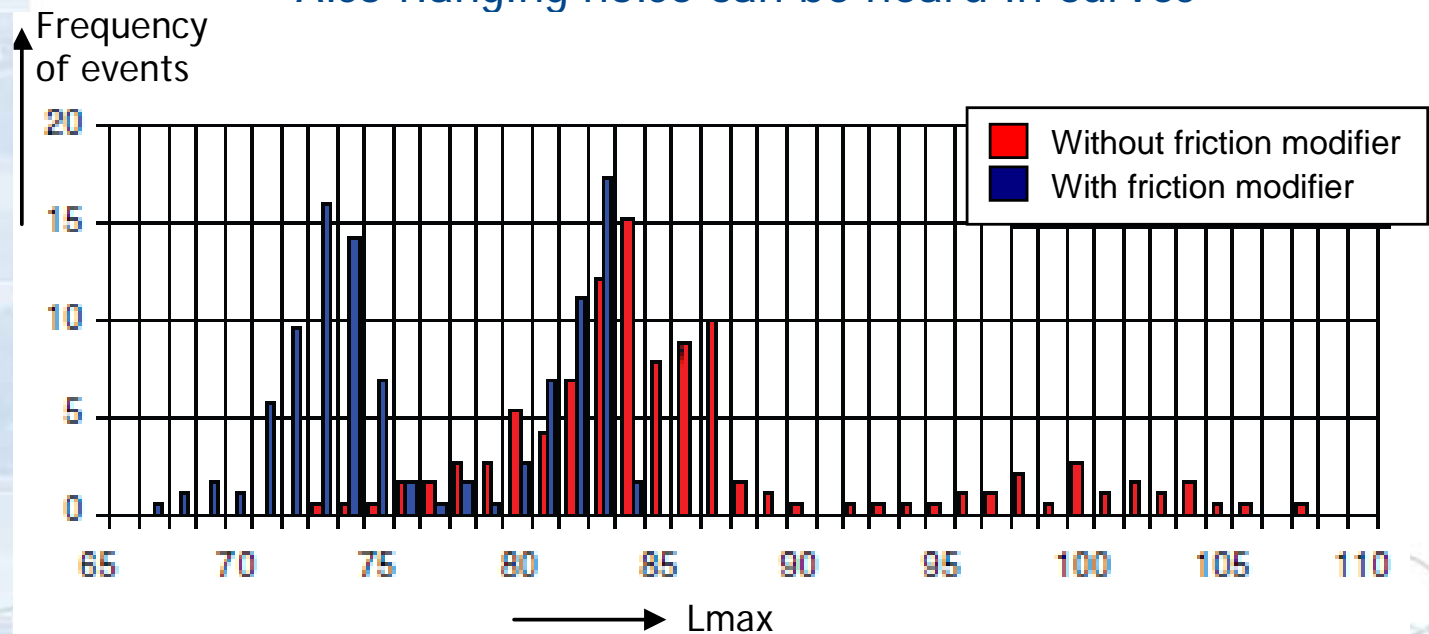
Friedrich Krüger (STUVA)
Günter Dinthob (ÖBB)
Jakob Oertli (SBB)
Jan Hlavaček (VUZ)
Jasper Peen (LRRE)
Jens Nielsen (CHARMEC)
Leo Baures (Bombardier)
Lisette Mortensen (Banedanmark)
Margreet Beuving (Plurel)
Markus Hecht (TU Berlin)
Marta Ruiz Sierra (Adif)

Martin Müller (SBB)
Michael Dittrich (TNO)
Michael Pal (Perth)
Nick Craven (Network Rail, UIC)
Nils Yntema (ProRail)
Paul de Vos (DHV)
Peter Hübner (UIC)

1. Curve Squeal Noise



- Curve squeal noise is tonal noise
- Caused by lateral stick-slip (frictional instability)
- Also flanging noise can be heard in curves



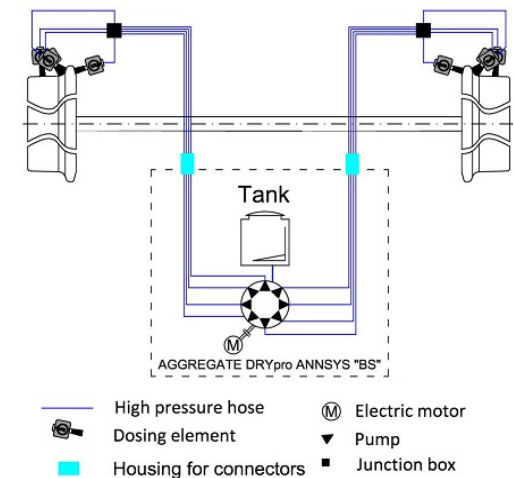


Wheel flange lubrication and top-of-rail application of friction modifiers (track-mounted or vehicle-mounted)

- proper application system maintenance is required
- some trains will still squeal in some curves

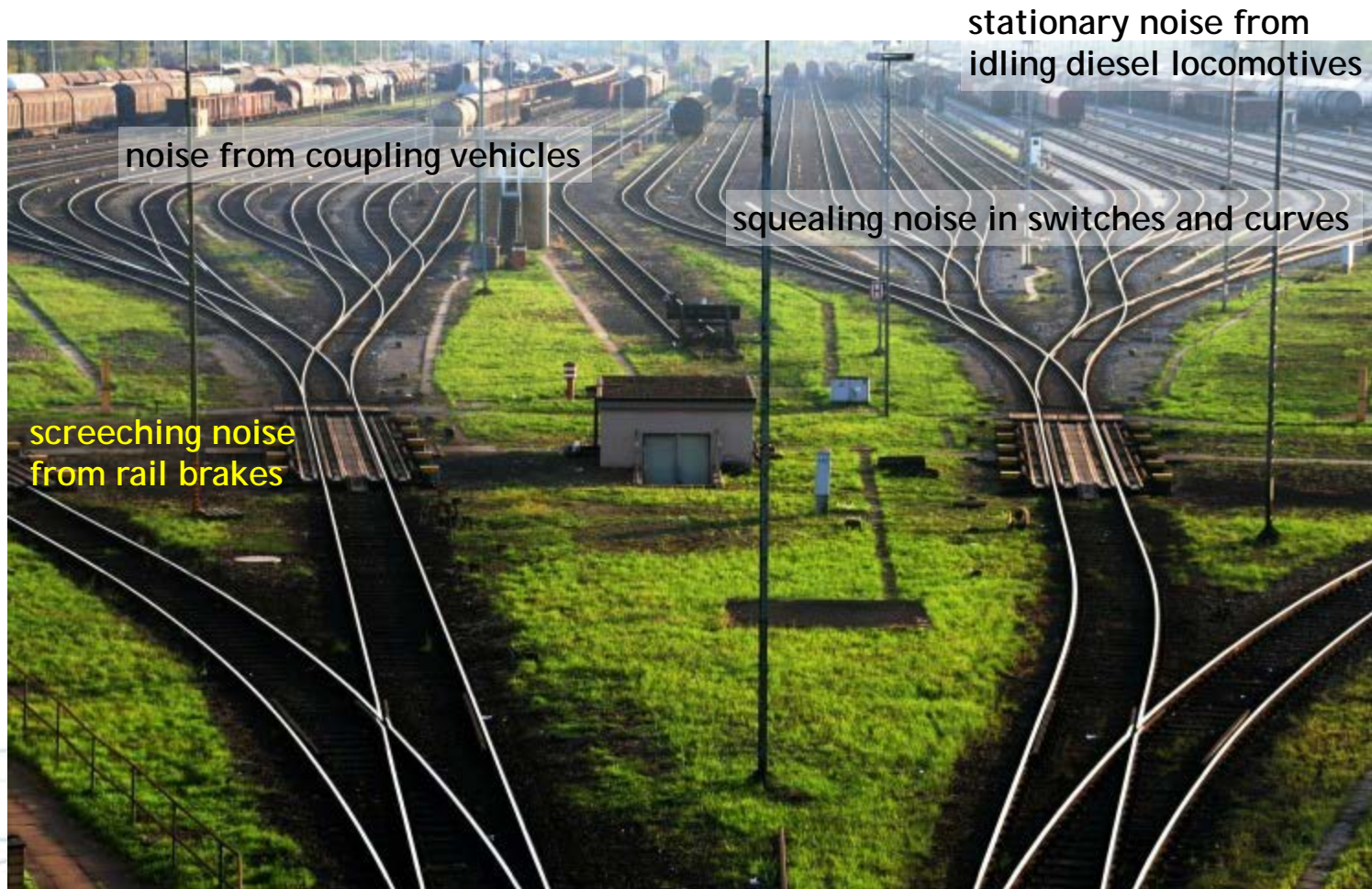
Other solutions:

- bogie design (Active Steering, yaw stiffness control)
- wheel dampers
- asymmetrical rail profile and gauge narrowing (?)



2. Noise from freight marshalling yards

- The main noise sources are:



- noise from rail brakes
 - apply sinter material segments
 - apply friction modifier
- noise from idling locos
 - specific technical solutions
 - track-side electric power supply for diesel locos



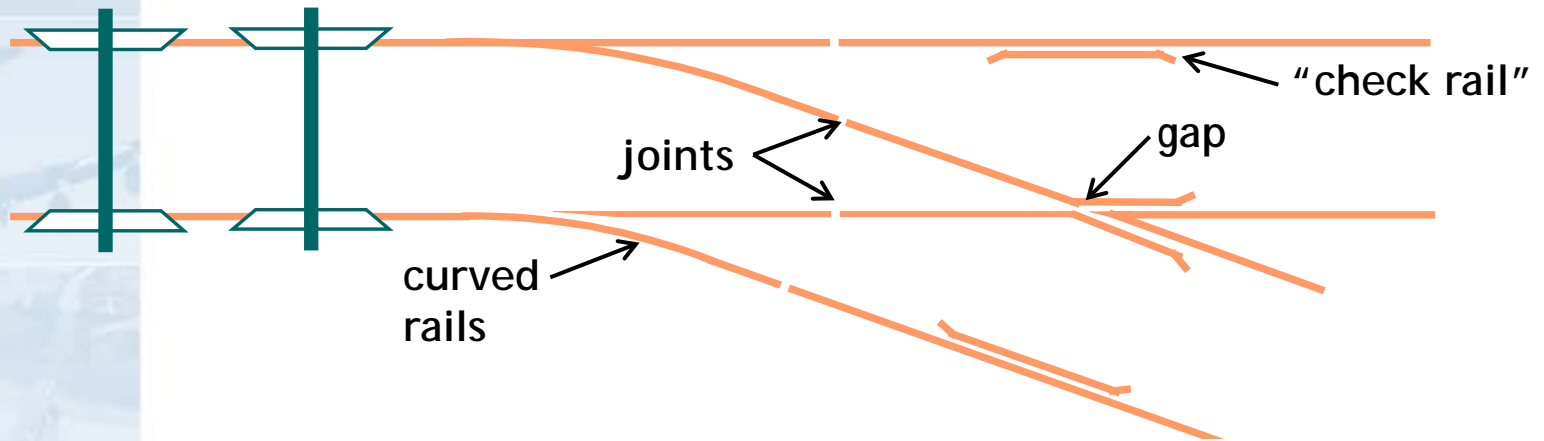
rail brakes with sinter material segments



rail brakes with friction modifier

3. Noise from switches

- Impact noise from rail interruptions
- Squeal noise due to curved rails
- Flanging noise due check rails (and curved rails)

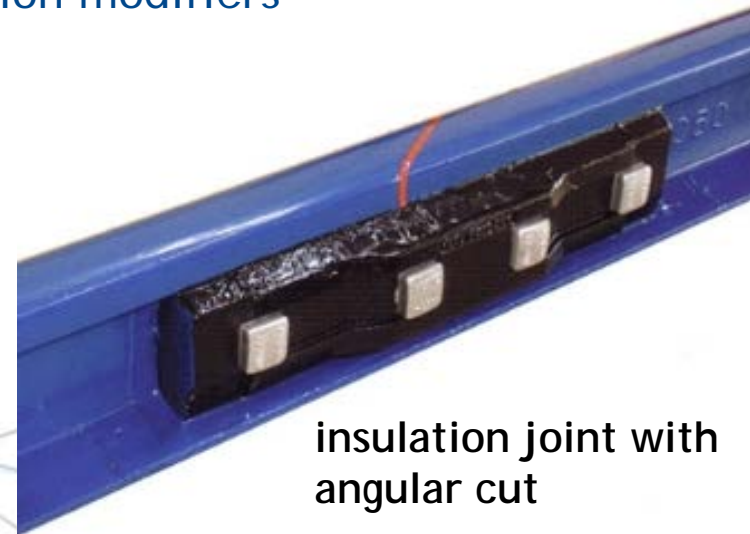


- Rail joints:
 - jointless switches (new)
 - thermite welding (retrofit)
 - silent insulation joints: angular cuts, pre-stressed ceramics, V-shaped cuts, glued joints
- Gap at the crossing nose:
 - 'swingnose crossing'
- Squeal noise:
 - lubrication and friction modifiers

thermite weld

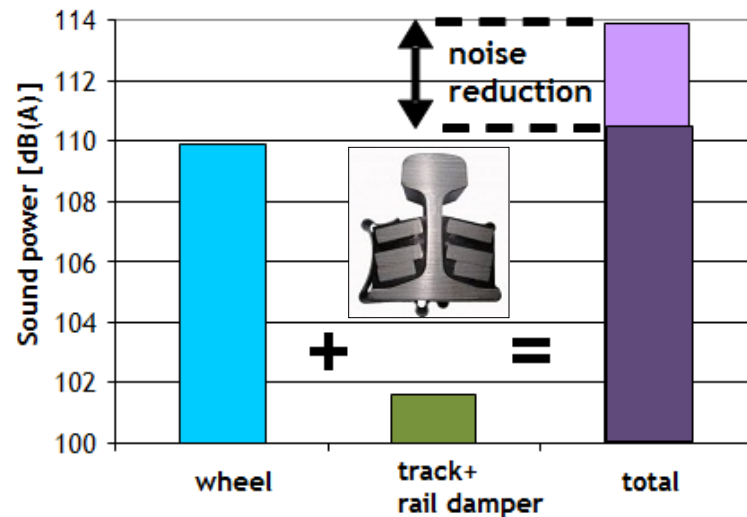
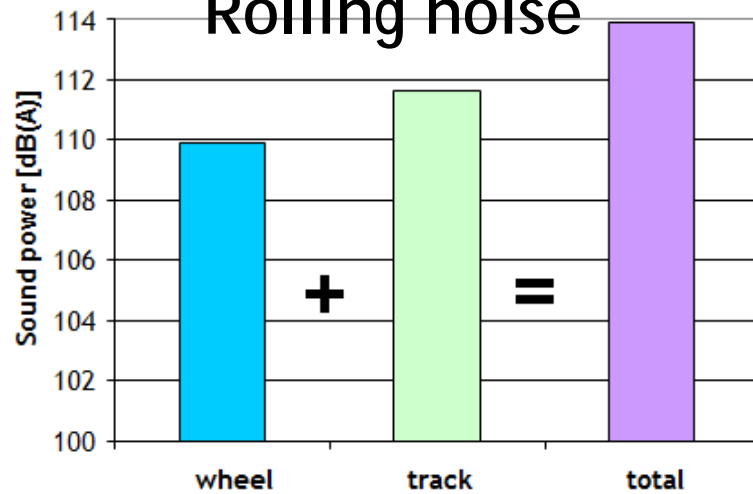


'swingnose crossing'



insulation joint with angular cut

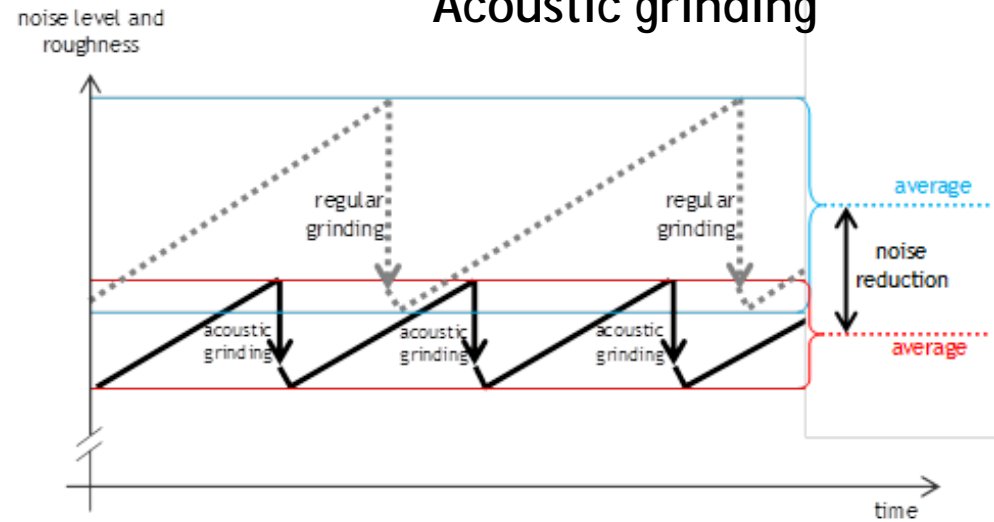
Rolling noise



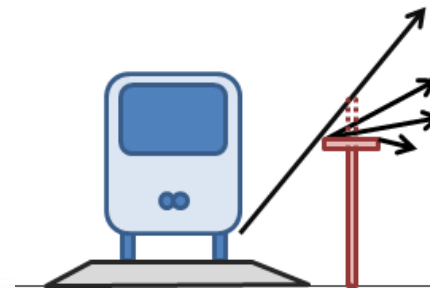
Rail dampers

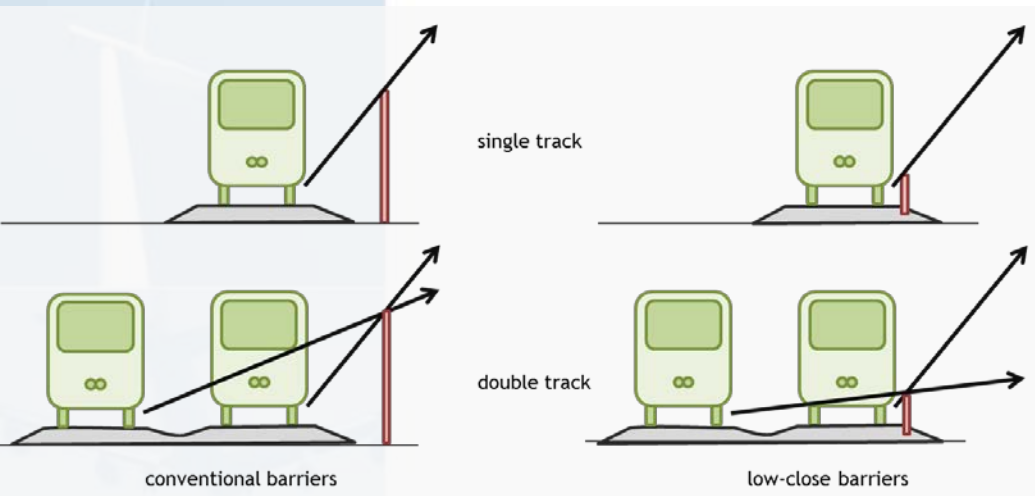


Acoustic grinding



Special barrier tops





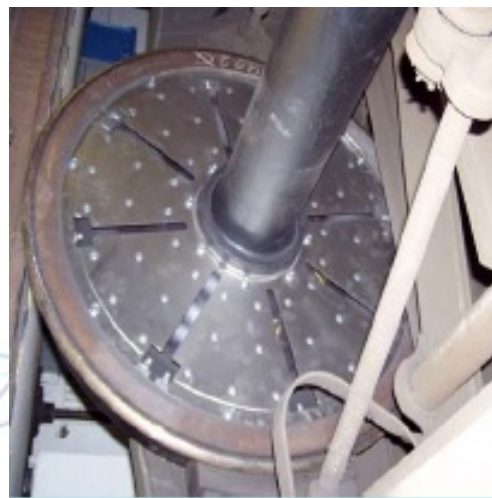
'Low-close barriers'



K and LL blocks



Wheel dampers



The Technical Noise Measures Catalogue contains

- description and solutions for 3 main noise issues
- description of 6 types of rolling noise measures
- decibel ranges of measured noise reduction
- indicative cost information for solutions
- many field test summaries
- manufacturer and supplier web addresses

written on 62 pages,

relying on about 150 references from recent literature

and oral information from 30 noise experts.

Thank you for your attention
Can I answer any of your questions?

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