

Demonstrations of Advanced Broadcasting Technologies

ITU Montbrillant (1st floor)

7-8 March 2023

High Dynamic Range

- **EBU-BBC HDR to SDR**

These demonstrations explore the two current methods for down mapping from High Dynamic Range (HDR) content to be shown on Standards Dynamic Range (SDR) displays. The aim is to demonstrate that whilst they can successfully be used for HDR production, they cannot be mixed in a production chain without damaging the SDR image.

- **NABA**

This demonstration explores a workflow that uses a Standard Dynamic Range (SDR) display set to 203 cd/m² using Recommendation ITU-R BT.1886 linear scaling from HDR black to reference white. Linear scaling unifies reference white with the same 203 cd/m² value so that shaders (vision operators) can observe HDR and SDR displays in close proximity and see camera outputs in both SDR and HDR formats. This is a more typical consumer experience which is closer to a 203 cd/m² peak-white luminance for SDR.

This demonstration optimally gain-stages content such that HDR and SDR images match, minus highlights and also reduces artifacts produced by other consumer TV picture modes (Vivid, Standard, Sports, etc.) which already stretch midtones.

- **Philips-InterDigital**

This demonstration shows dynamic HDR<->SDR conversions providing a “no-compromise” SDR-HDR-SDR round-trip production for live-TV and post-production. It ensures that HDR content creation and conversion processes do not alter the original creative intent of SDR sources. As a result, SDR content converted to HDR during playout can be restored to original parameters when displayed on SDR devices. In addition, the demonstration presents new features that provide a degree of compatibility between dynamic and static conversion and should thus facilitate the transition from static to dynamic conversion in the industry.

Live production workflows, such as sport events, require complex pipelines to deliver HD, UHD, SDR, HDR streams. Diverse tone mapping and inverse tone mapping operations are required to create premium HDR while preserving the SDR quality. Dynamic conversions are able to adapt to changes in lighting or composition, able to optimize conversions to preserve detail by dynamically prioritizing shadows or highlights.

For further details go to <https://advancedhdrbytechnicolor.com>

Energy Aware Broadcasting

- **InterDigital**

This demonstration explores a content-adaptive technology that processes video frames so that when displayed on a television it draws less power maintaining the visual quality of the images. The technology is based on the premise that individual pixels can be reduced in value by a small amount without this change becoming noticeable to the user.

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- **Carbon Calculators**

This is a video only demonstrating how a carbon calculator can be used during programme making. Carbon calculators are used by broadcasters, programme makers and content distributors as part of managing sustainability strategies. Scanning the on-screen QR Code will open a website which gives information about carbon calculators in use primarily in Europe.

5G Broadcasting

- **EBU-Broadcast Networks Europe**

This demonstrates the Nakolos middleware (a joint project from ORS/ORF and bitstem GmbH developing solutions for content providers) live switching functionality which guarantees an uninterrupted viewing experience anytime, anywhere. If the user leaves the broadband reception and 5G Broadcast is available, the middleware will seamlessly switch the stream to 5G Broadcast without the user noticing and vice versa.

A content provider can setup a threshold when it is more cost efficient to use 5G Broadcast. Based on this functionality, content providers can reduce delivery costs by using free 5G Broadcast capacities of Broadcast Network Operators on demand. By monitoring demand in a specific area, where the threshold is reached, the Nakolos middleware enables 5G Broadcast in that area switching users automatically.

For further details go to <https://www.nakolos.com>

- **China Broadcasting Network Group Corporation**

This is a poster demonstration of 5G New Radio Multicast Broadcast Service System (5G NR MBS) which is a new generation broadcast technology for various devices. Utilizing the wide coverage of 5G cellular base stations in various complex scenes to achieve wide-area coverage of television broadcast services. 5G TV high-power tower broadcasting technology is used to provide services for mobile devices within its coverage.

Advanced Terrestrial Broadcasting DVB-I

- **EBU-DVB**

Demonstrating a SmartTV displaying the German DVB-I Pilot with contributions from 19 organisations, including ARD, bmt, EBU, Dolby, DVB, Fraunhofer FOKUS, LG, MIT-xperts, OnScreen Publishing, ProSiebenSat.1 Media, rbb, RTL, Sofia Digital, Sony, TARA Systems, TP Vision, Vestel, WDR and ZDF.

DVB-I is an open companion system to the DVB broadcast delivery systems. It is an easy-to-use aggregator of services available through broadcast and internet platforms that enables viewers to find and enjoy the broadcasters' services within reach of their receiver and player - whatever the delivery platform and terminal.

The DVB-I app needs to be downloaded to a Smart TV, Smart Phone, or Tablet. DVB-I will enable broadcasters to adapt their services over the coming years to their content and the public's media habits, usage, and equipment.

For further details: <https://tech.ebu.ch/contents/publications/presentations/2022/ibc2022/the-german-dvb-i-pilot.html>