Tue, 31 October 2023
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #827

Editorial

Great DVN Team Effort For Great DVN Study '23

During the last 10 months, our experts have worked diligently on the 2023 DVN Study. It will join the existing library of DVN Studies:

- Impact of a Changing Automotive Industry on Exterior Lighting (2017)
- Lidar (2019)
- New Lighting Functions (2020)
- Lighting Under Pressure (2021)
- Market Forecast on New Lighting Features (2022)

This year, we've decided on detailed coverage of ADB. The first ADB system came on the market in 2010, 13 whole years ago. There's been enormous evolution in the technology, technique, regulation, and commercialization of ADB, so now is a fine time to zoom out and see where we are. Here's a quick sample of just a few of the topics in the 2023 DVN Report:

- Evolution of ADB light sources, and from mechanical to digital beam control
- Growing segment and pixel count, with implications for functionality and performance
- Rapid but spotty evolution in the world's regulations and headlight safety evaluations
- Informed forecasts for each technology, in terms of volumes, equipment rates, and cost/price
- Opportunities and challenges for ADB in the future

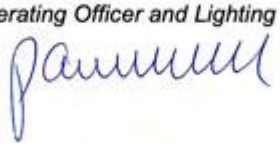
We're confident you will find pertinent, actionable information, whether you are an ADB expert or a beginner, and whether your interests lie in mechanical design, style, electronics, regulation, ratings, optical design, cost, safety performance, CO_2 emissions, strategy…there is substantial content here for everybody.

The 2023 DVN Study will be available from 1 November, and it is **available for purchase**. Please feel free to **contact me** with any questions you might have; We are always listening to you.

And now we are focussing on the final sprint for our Shanghai DVN Workshop on 7 November. I will bring printed studies in my luggage, in English and—for the first time—in Chinese, as well!

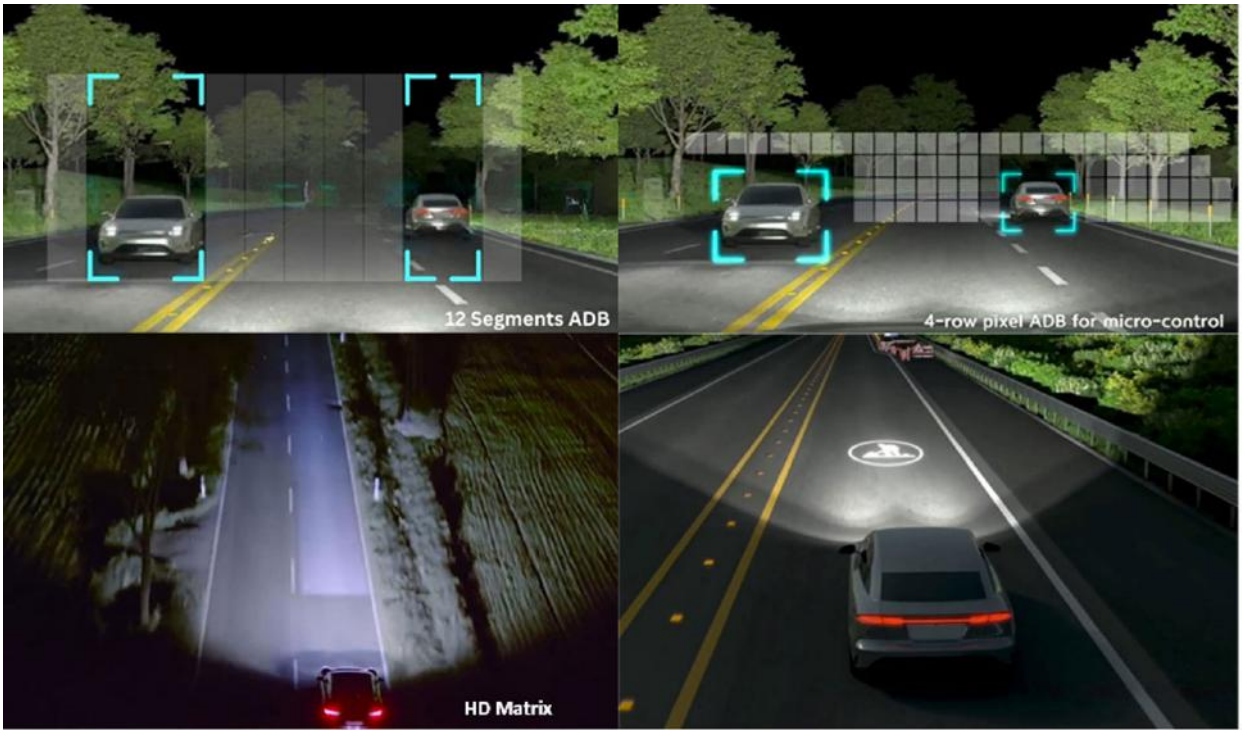
Take care,

Paul-Henri Matha
DVN Chief Operating Officer and Lighting General Editor

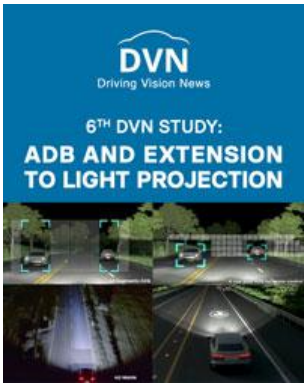


In Depth Lighting Technology

2023 DVN Study Goes Live This Week



ADB: quite a vast topic for a single study! We wanted to do a complete overview of the adaptive driving beam (or glare-free high beam) function well known in Europe, but less so in China and even less in the USA on account of the regulatory situation there.



But globally, there are now 13 years' experience with ADB. It's mature as a concept, but the technology, technique, performance, and regulations are still evolving at a brisk pace. ADB functionality improves year over year, with better camera detection and wider field of illumination. Now we have 'seamless' ADB: when you drive, you do not detect that you are in ADB. You have the best light at all times. You do not detect any dark zones or moving light.

To be thorough, we have tapped great experts from automakers and suppliers to develop the different chapters of the study. Here's the table of contents:

We have focused the study on digital technology, and divided the technology into four categories: S-matrix (single row of pixels), M-matrix (multiple rows), HD-matrix (thousands of microLED pixels), and UHD-matrix (millions of pixels).

For each solution, the study explains the optical concept, use cases, the possibility to do road projections, the integration challenges, cost, technological constraints, and current and forecasted equipment rates.

There's detailed coverage of regulations and rating systems, with the latest information and analysis on everything from UN Regulations to U.S. safety standards to C-NCAP and J-NCAP ratings.

While ADB is now well known, some automakers are still reluctant to offer it. Its complexity to develop, expensive cost, and need for fine tuning are some reasons for relatively low equipment rates—globally, around 9 per cent. We are convinced that the rate will increase to reach an average value of 27 per cent in 2030, by dint of cost reduction, ADB integration in safety ratings, and the potential to have it in USA.

The future is great for ADB! Please enjoy the study. All your comments are welcome.

Lighting News

DVN Interview: Polestar's Christophe Ferreira

LIGHTING NEWS

By Paul-Henri Matha, DVN COO

Christophe Ferreira is Polestar's lighting design manager. He will give a keynote speech on the second day of the Shanghai DVN Workshop, and will be a panellist for the design round table.
He graciously talked with us about his company and his work.

DVN: Hello Christophe! Will you tell us about yourself and your activity at the Polestar Studio in Gothenburg since joining the company 18 months ago?

Christophe Ferreira: Hello Paul. I'm design manager for exterior components (lighting, wheels…) since April last year, and I'm really proud to represent the brand at DVN in Shanghai. As a designer, this the place to be; Polestar is a design-driven company, and I'm grateful to be part of this amazing team. I previously worked at Renault, where I learned from inspiring and extremely talented people.

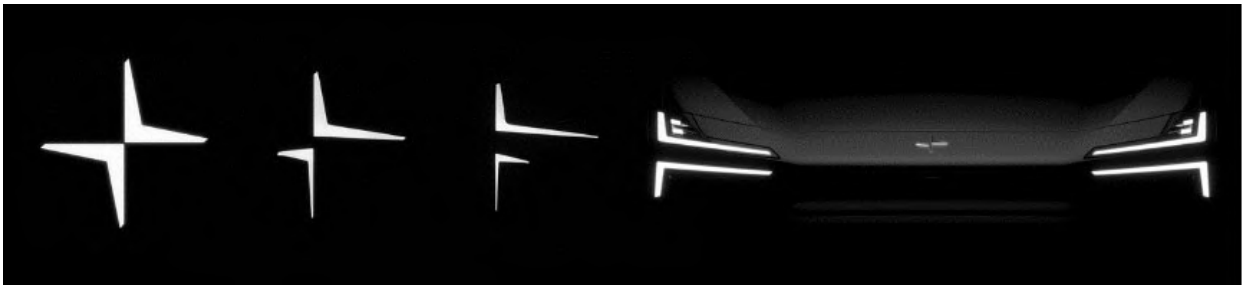
DVN: We met Lotus—like Polestar, a part of the Geely Group—in September. Can you tell us about the effect of Geely's pyramid strategy of luxury, individuality, and sporting in terms of how you define your lighting business?

C.F.: If you look at the Geely brand portfolio, Lotus is really on the luxury level—competing with brands like Lamborghini and Ferrari—while Polestar would be more

into premium performance level.
Regarding lighting strategy, we would focus on finding innovative solution to fit our exterior designs the best, with PQ focus also. So, homogeneity and packaging are optimized, with a good compromise regarding beam performance.

DVN: Your front lighting signature has evolved on the Polestar 1, 2, and 3, and now the synergy concept, with increasing difference to the Volvo Thor's-Hammer shape. What's the future of the Polestar-specific signature?

C.F.: Yes, like you said we are getting away from the Thor's Hammer to create a unique brand signature with our 'dual blades'—introduced on the Polestar 3 and 4—which also includes a subtle illuminated logo.



On our Synergy concept it's a bit different, the result of our design contest we've had since 2020. It combines three winning designs which took the honours in the latest competition from a field of over 600 entries. They have created their vision of our lighting signature, not linked to our actual lighting strategy.

DVN: You've hidden the lighting functions on the Synergy. Where are they, and what is their technology?

C.F.: It's an electric fantasy supercar, made for racetracks, so no functions were implemented. We also have an AR-HUD in the cockpit so I guess no lighting functions would be needed with this futuristic and fantasy approach.

DVN: Are you working on animated welcome/farewell sequences?

C.F.: Yes, we have our welcoming-light scenario we called the 'birth of a star', starting with a pulse at Y0 (like on the Polestar 3 rear lamp, for example) and then spreading into the rest of the lamps. Illuminating our logo on the Polestar 4 allows us to go further into this logic.

DVN: Speaking of rear lamps and signatures, your Polestar 2, 3, 4, 5, and 6 have a full-width lamp, and the Synergy concept also. Is it part of the polestar signature?

C.F.: The light signature on the Synergy is a creation from the two contest winners, Devashish Deshmukh and Swapnil Desai. Globally in Polestar, on the rear we create a lighting signature surrounding the trunk body panel like a box. The best example would be on the Polestar 2 with its bold and iconic signature.

DVN: You have also designed the wheels. That's far from DVN interest, but what can you tell us about them?

C.F.: Thanks for asking. In fact during the process, our design team helped the two winners to merge their ideas into this awesome concept car, and I had the opportunity to give a hand to Juan Pablo Bernal, Maxime Célérier, and Christian Rösborg to create a unique wheel design without any feasibility constraints. The idea was to create a contrast between the sleek and aerodynamic exterior body and this bold and dramatic wheel.

Hella's Cylindrical Lens Arrays for Slimline Headlamps

LIGHTING NEWS

Bi-LED module (left), CLA module (right)

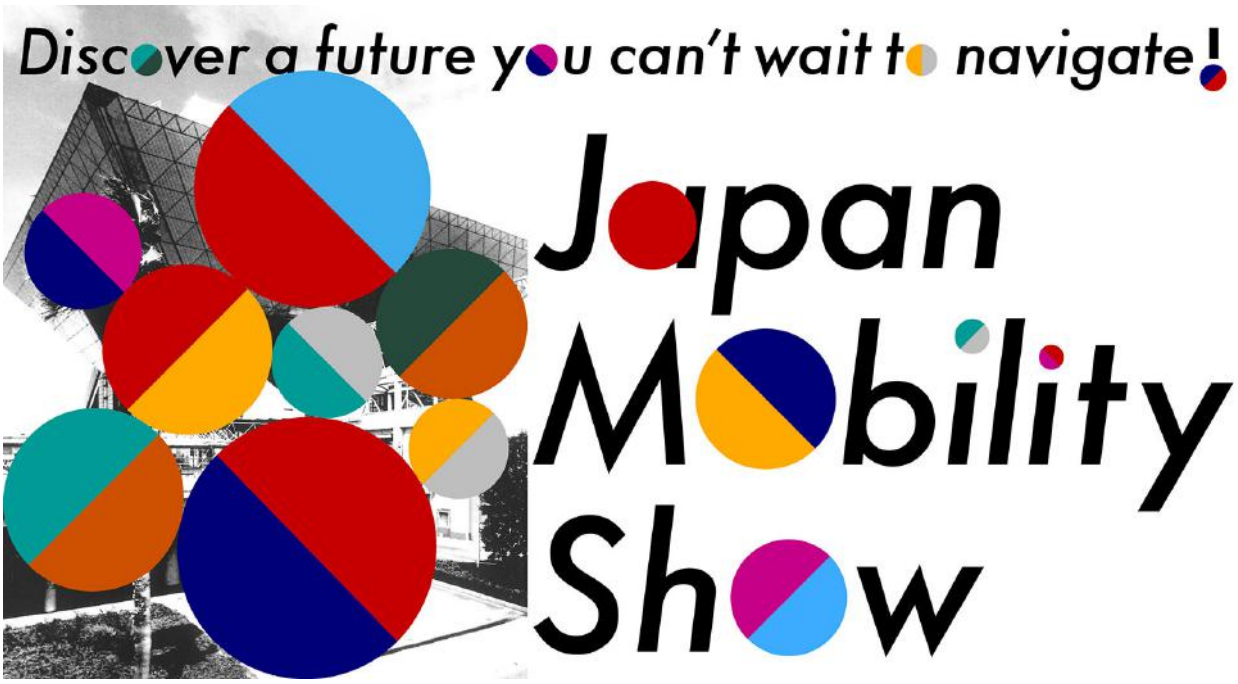
CLA—cylindrical lens array—is a new technology Hella are offering to enable unbelievably narrow (1-cm) headlamp signatures with remarkable precision, whether orientated horizontally, vertically, diagonally, or as a combination of these, CLA offers a world of new design possibilities while keeping costs low by using standardized components.

Three fundamental components cooperate to make the magic work: the printed circuit board (PCB); primary optics, and customer-specific secondary optics. While the PCB and primary optics are standard components, the secondary optics provide freedom to create a unique and tailored headlamp signature for a similar day- and nighttime appearance. Depending on the range of functions, the individual modules can be combined and arranged to create the signature required for the main light functions.

Scalability is another feature of CLA. The secondary optics remain consistent while the modules behind vary. This enables headlamp variants, ranging from low and high beam to ADB functionalities. As **previously reported** in DVN, Hella have already introduced their first products with the new lensing technology.

Japan Mobility Show

LIGHTING NEWS



Five newly unveiled cars summarize the Japan Mobility Show held last week.

Toyota FT-Se concept

The front end immediately catches the eye thanks to a blacked-out grille and large air intakes complemented by LED daytime running lights that run vertically to the base of the fascia.

The thin LED taillights, helping the car slice through the air are creating a wide look from the rear with floating feeling.

Honda Prelude concept

Honda's Prelude Concept serves as a harbinger for future Honda models. It has a trendy full-width light bar at the front, with the main functions included in a Honda-brandmark wing-shaped design.
At the back, a sleek single-bar signature is integrated within the spoiler.

Infiniti Vision Qe concept

The Infiniti Vision Qe concept showcases the evolved design form "Artistry in Motion" in the all-electric era. Infiniti's signature double-arched grille has been updated for the EV era; it is now represented by sculpted lines within the front fascia and illuminated with a bright LED outline.
A 'digital piano key' lighting signature graces the car's front and rear. An animated sequence of dancing light is initiated by the approach of a key holder, as if to welcome the owner back to the car in a display of thoughtful hospitality.

Mazda Iconic SP concept

The front features a modern interpretation of the famous pop-up headlights with integrated modules underneath, a nod to the heritage of the brand.
The back presents a nice 3-dimensional signature with a great depth effect thanks to mirrors.

Lexus LF-ZC concept


The front of the Lexus is composed of sharp lines and graphics, embellished by a brand-identifying checkmark DRL signature. The rear presents a great stance with filigreed l-shaped LEDs combined with an artfully-bent, full width stripe and illuminated logotype.

Nissan Hyper Force concept

This latest addition to Nissan's series of five 'hyper' concept vehicles has a fine-line full-width white light stripe emphasizing the leading edge of the hood, and forming an eyebrow over main lights represented by three stacked horizontal stripes. Round rear lights hearken vintage Nissan Skylines; this iteration has concentric rings.

Continental's µLED Tech for Dynamic Projections

LIGHTING NEWS

Dynamic near-field projections

Personalized welcome messages

Continental have developed a new system for generating dynamic projections near a vehicle. A compact, powerful projection module based on microLEDs provides for increased safety in the immediate vicinity of a vehicle. The new solution is easy to integrate into a vehicle because all of the components fit into a cube measuring only 5 cm on a side.

Continental Automotive's Head of Light and Actuator Solutions Alem Helias says "With our new near-field projection system. We want to increase road safety and prevent traffic accidents involving injuries from happening – in line with our commitment to Vision Zero. MicroLED technology is a new approach to near-field projection. We want to take an active part in its design and develop it further with our customers".

Driver Assistance News

CEA-LETI: New Research Initiative to Enhance V2V

DRIVER ASSISTANCE NEWS

CEA-LETI the research institute for electronics and information technologies, based in Grenoble, France, has announced a new research initiative to enhance vehicle automation and cooperation. Its stated aim is “to expand the latest developments in vehicular wireless communications to improve reaction time, pedestrian detection and overall vehicle performance”.

Combining learnings from its participation in three European Horizon 2020 (H2020) projects, CEA-Leti scientists have consolidated their institute’s expertise in vehicle-to-everything (V2X) communication technologies and standards.
Their focus includes evaluating and demonstrating connected and cooperative vehicular systems to improve automation and help ensure the safety of vulnerable road users, such as pedestrians, workers and cyclists.

“The ultimate goal of our ongoing work is to help our partners in the automotive and related industries understand and adopt the benefits of V2X cooperative communications for improved safety, efficiency and automation performance,” said Benoît Denis, research scientist
Denis added that while V2X communication technologies and protocols were initially developed to improve road safety through cooperation, the growing use of autonomous fleets of collaborative robots and drones raises similar research questions and challenges in a variety of complex mobile operating contexts.
“The cooperative communication approaches developed for vehicles could therefore also be used for collision avoidance and cooperative maneuvers by autonomous robots in smart factories,” he said.

General News

Stellantis: €1b Purchase of a Stake in Leapmotor to Offer Affordable EVs

GENERAL NEWS

Leapmotor TO3

Stellantis says its $1.1 billion purchase of a stake in a Chinese electric vehicle maker will help it offer more affordable EVs and gain an edge on rivals bracing for an onslaught of cheaper exports from the country.

"The Chinese offensive is visible everywhere," CEO Carlos Tavares told reporters on a call about the acquisition. Through the deal with Zhejiang Leapmotor Technologies, "we can be benefiting from this Chinese offensive rather than being a victim."

Stellantis will end up with about 21% of Leapmotor and two board seats after the deal. Crucially for Tavares, it will also have a controlling stake in a joint venture incorporated in the Netherlands that will allow Stellantis — the maker of Jeep SUVs and Peugeot and Fiat automobiles — to build and sell some Leapmotor cars outside China.

Leapmotor vehicles will arrive in Europe in two years, at the latest, according to Tavares. Its EVs may be built in Stellantis plants around the world, including the U.S., if tariffs imposed on them will otherwise be too steep.

Stellantis earlier this month unveiled its e-C3, the cheapest Europe-made EV, with a starting price of €23,300, a key model at a time when some countries, notably France, are changing their incentive systems to subsidize locally made cars.

Leapmotor's technology and its better insights into China’s EV supply chain will enable Stellantis to produce cheaper EVs, without relying on the outcome of the EU's probe, Tavares said.