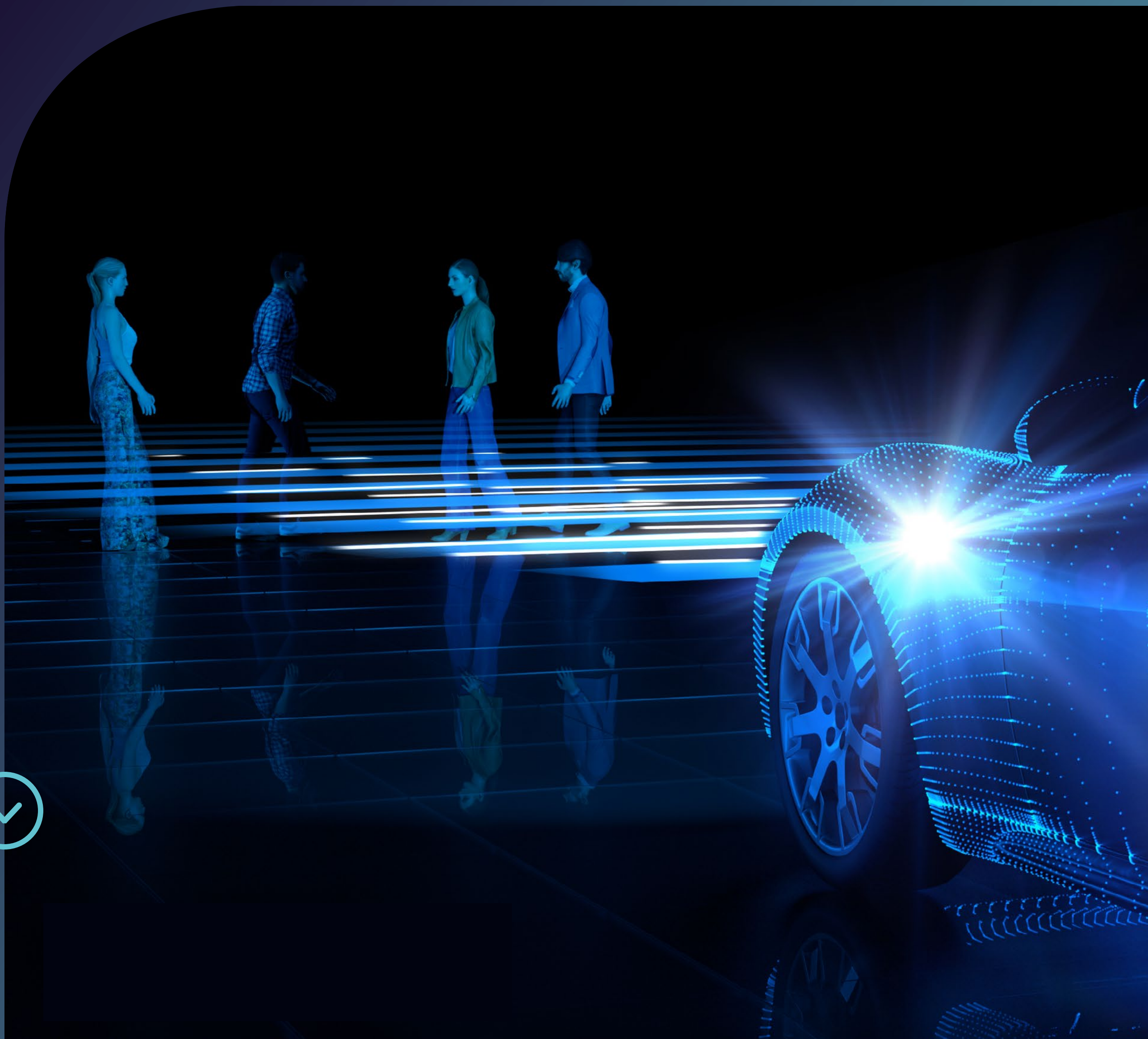# obsurver

dSPACE

# Demonstrating RADAR Signal Degradation

RADAR is used widely across ADAS features for object detection and ranging

The demonstration consists of an automotive specification RADAR sensor and a dSPACE target simulator.

RADAR is positioned behind vehicle bumper with different paint thicknesses in a real vehicle and impact on sensing is shown

dSPACE Automotive Radar Test Systems (DARTS)

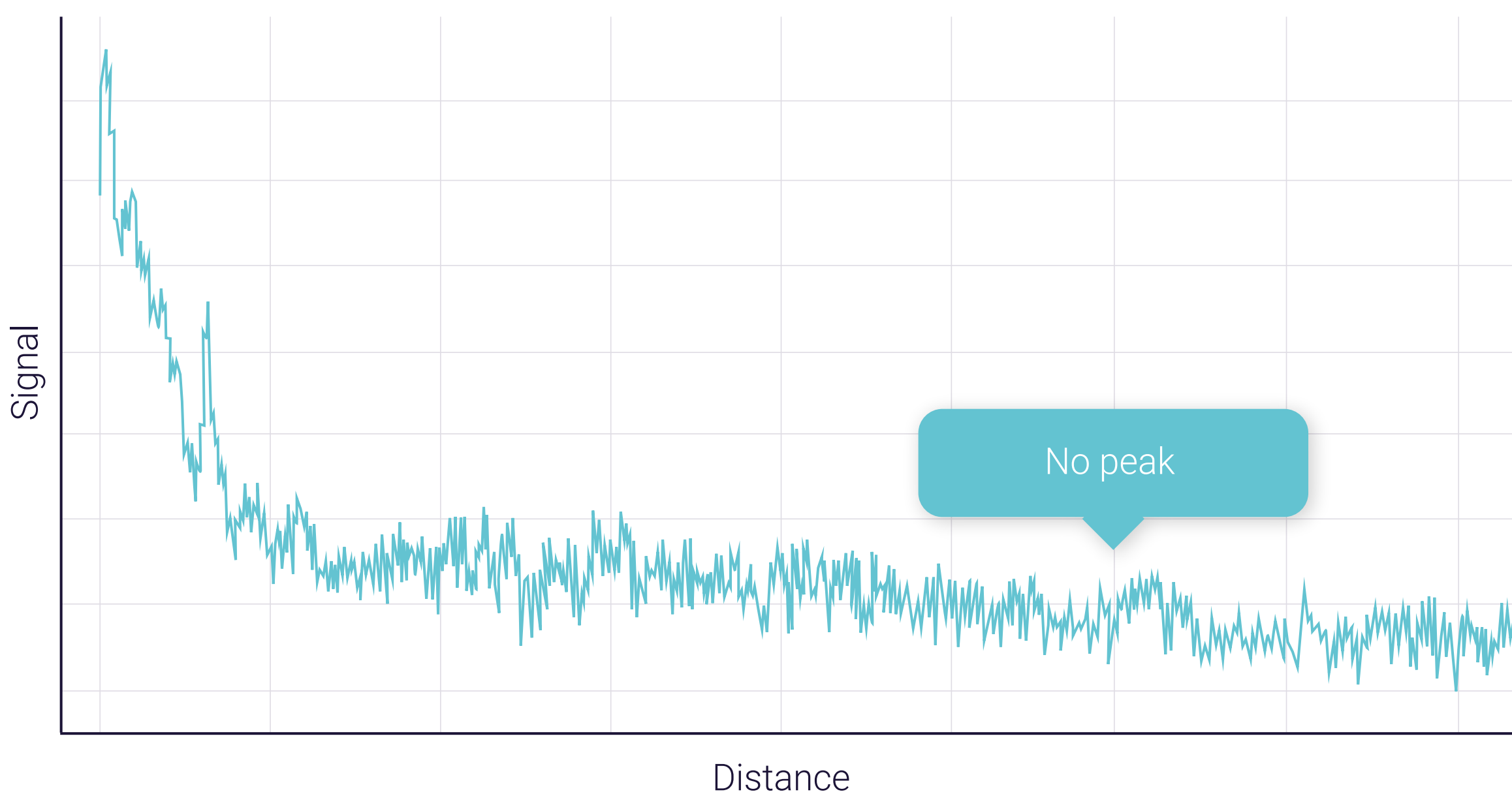DARTS

Painted Bodywork

Radar Unit
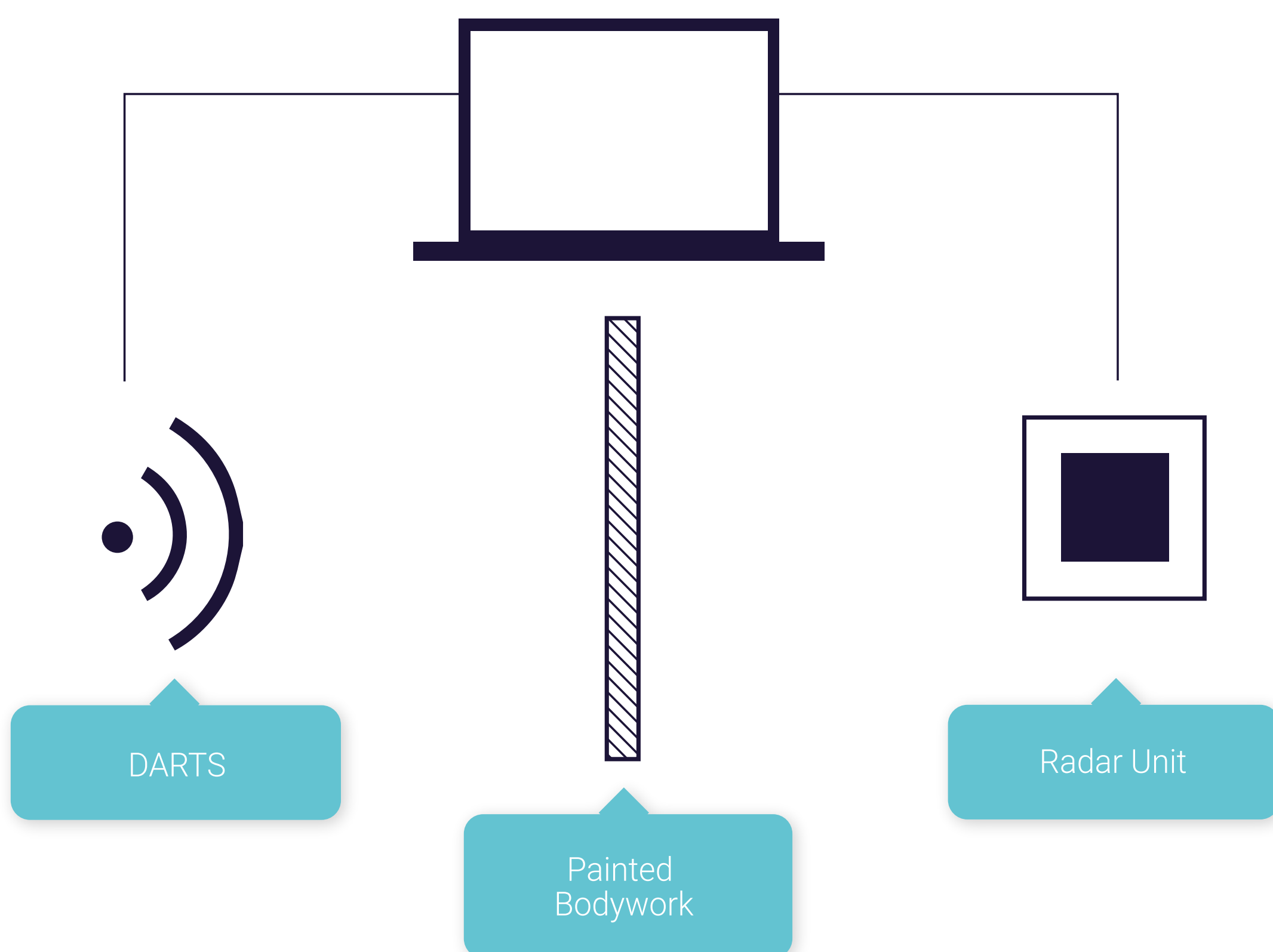
DEMO SETUP

The sensor output is degraded, we can think of this as applying 'fog' to the RADAR – visibility is reduced but the driver, and more importantly, the vehicle's ADAS computer is not aware of such 'fog' and the resulting reduction of performance

ORIGINAL OEM PAINTWORK

**AFTERMARKET PAINTWORK WITH
THE SAME VISUAL APPEARANCE**

Calculations

- Lacquer pattern with different paint finish but same appearance

- For the radar, however, this means higher attenuation

- Higher damping also means shorter range

Result
~8dBV degradation in detection signal could mean the ADAS system performance falls below safety threshold

Worst case
targets that should trigger emergency braking are no longer visible, and the ADAS system fails to act resulting in a collision

STOPPING DISTANCE

Vehicle with correct functioning systems stops in time

STOPPING DISTANCE

Vehicle with ADAS system failure causes accident

Causes could be as simple as aftermarket painting or other real-world effects *(stickers, scratches, aging of sensor, etc.)*

Effects can happen on other sensor modalities with an increased range of causes, such as:

- **Aging effects** (electronics and materials)

- **Degradation effects** triggered by external factors

- **Aftermarket handling** during repairs, servicing etc.

- **Dirt and occlusions**

- **Artificial Intelligence nonlinearity effects** may amplify any degradation effects

Workshop & car Inspection lifecycle

1 Year   1 Year   1 Year

Car Lifetime
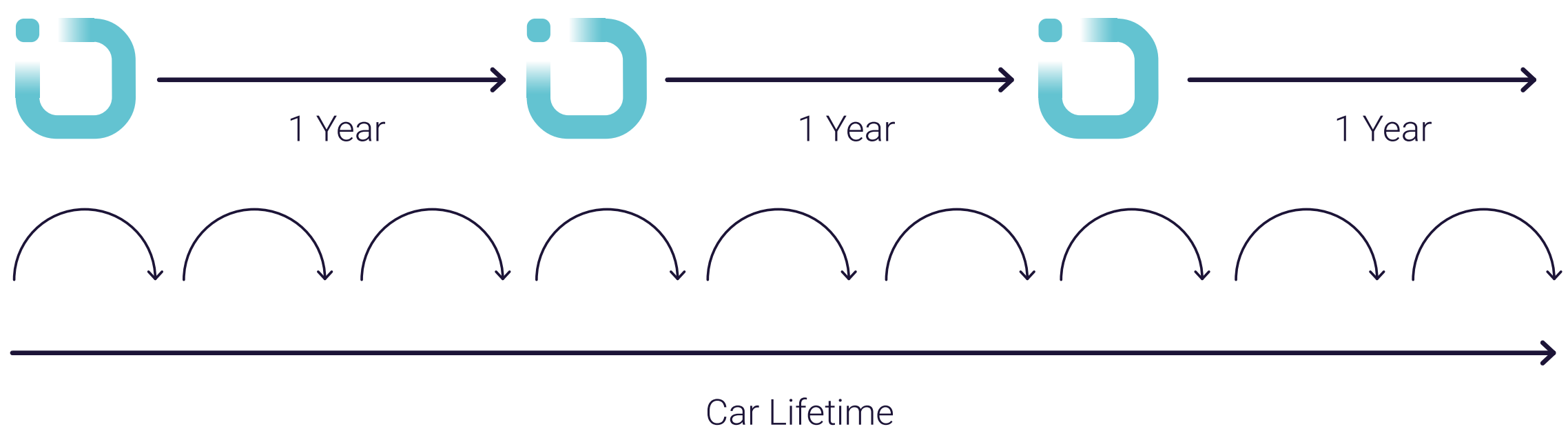
obsurver develops solutions for detection of long-term effects on vehicle level

- Impact on vehicle level is analyzed

- Predictive maintenance can be triggered (trend analysis)

- Link sensor performance to function domain *"What is the real impact the driving function"*

- Solution can be used during regular inspection or continuously as an onboard software solution

- Works for any sensor modality

See our website or contact us for more information

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True Safety