Over-the-Air (OTA) Testing Solution for Production-Ready Automotive Radar Validation – Practical Results and Next Challenges

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Modern vehicle development expands to include more and more sophisticated electronic-based solutions to enhance, for example, automatic emergency braking (AEB), adaptive cruise control (ACC) and lane-change assistance (LCA) and other advanced driver assistance systems (ADAS). FMCW-based 76-81GHz radar systems are playing a key role in implementing these functionalities [1][2]. As these applications are expected to represent a considerable part of the ongoing developments to the fully autonomous driving cars, companies must be prepared to test them thoroughly, since they represent the utmost safety level [3].

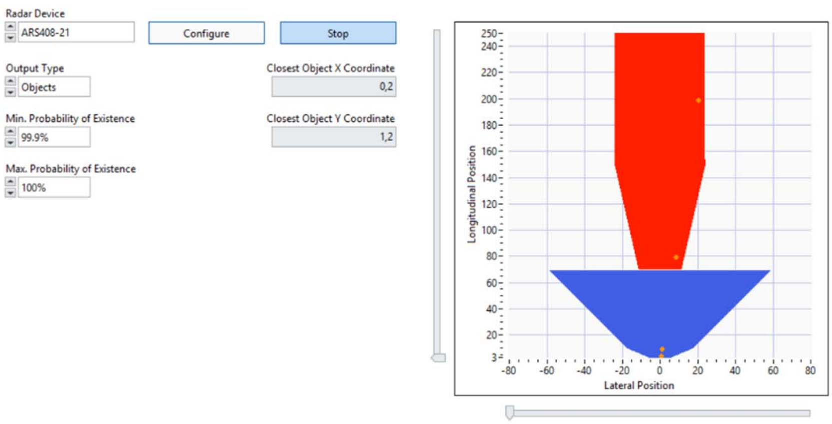

Figure 1. ARS408-21's measurements with the four simulated objects at the test anechoic chamber.

This paper works on top of the testing solution and preliminary measurements introduced in [4], and will show confirming results on the direct far-field over-the-air (OTA) testing concept obtained for both a commercial-grade automotive radar, the Continental ARS408-21 [5], and a development kit, the Texas Instruments AWR1642 [6]. Testing was conducted in a shielded anechoic chamber with emulated objects generated by a Rohde & Schwarz AREG100A [7]. We will discuss some of the future challenges for this radar test system, more specifically by analyzing accuracy/resolution specifications required on the 3D pan-tilt block, refining EIRP measurements for radar antennas radiation diagram calculation, addressing special needs of temperature and humidity conditions at the radar unit under test (UUT) zone, and changes on the anechoic chamber onto a compact range far-field concept.

References

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