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Development of a Smart Flexible Transducer for the examination of complex components

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The irregular state of surface and the complex geometry of such components (nozzles, elbows) may lead to degraded inspection performances. The unmatched contact between the wedge and the component due to an irregular surface geometry would result to loss of sensitivity and beam distortions. Complex geometry could also limit the scanning displacement of the probe, therefore the area would not be entirely covered. To improve such inspections, a new concept of contact transducer has been developed by CEA. This "smart contact transducer" is a flexible phased array transducer, able to fit a complex profile, and to compensate the beam distortions using optimised delay laws computed in real-time using a specific instrumentation inserted in the transducer. Thus, the integrated phased array probe just needs to be positioned above the inspection area and the process is self-adaptive