Dynamic calibration of pressure sensors using shock tube

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Scientists at NPL's Dynamic Pressure Sensor Facility have published a paper, Towards a shock tube method for the dynamic calibration of pressure sensors, in *Philosophical Transactions of the Royal Society A*.

The paper outlines the development of a plastic shock tube, working at 14 times the pressure of the atmosphere (1.4 MPa). The tube is made from PVC-U tubing and provides a low-cost, light and easily modifiable basis for research into the dynamic characterisation of pressure sensors. It provides pressure readings within a nanosecond- exceptionally quick for a mechanical process.

This will assist with research into improved car and aircraft engines that require accurate measurements of rapidly changing pressures. At present, the pressure sensors used are calibrated statically but shock waves can provide a known, rapid pressure step. There is a need to ensure that these dynamic measurements are giving true real-time pressure values, as they are essential for optimising the industrial process being controlled - saving money and reducing environmental impact. Metal shock tubes are used in the laboratory to generate shock waves but they can be expensive, unwieldy and slow to modify.

More information: Stephen Downes, Andy Knott, and Ian Robinson. "Towards a shock tube method for the dynamic calibration of pressure sensors." *Phil. Trans. R. Soc. A* August 28, 2014 372 2023 20130299; DOI: 10.1098/rsta.2013.0299
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