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2S-module prototyping and qualification for the CMS Outer Tracker upgrade at the HL-LHC

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In preparation for the High Luminosity LHC, the whole tracker detector of the CMS experiment will be exchanged within the Phase-2 Upgrade until 2027. The new outer tracker will be made of approximately 13000 silicon sensor modules called 2S modules (consisting of two parallel mounted silicon strip sensors) and PS modules (one pixel and a strip sensor combined in a module). These modules provide tracking information to the Level 1 trigger by correlating the hit information of both sensor layers and, thus, allowing to discriminate particle tracks by their transverse momentum. To guarantee successful operation during data-taking, the production of the outer tracker modules has to fulfill strict requirements. This talk will present practical procedures about assembly, electrical, thermal and vibration tests performed at CERN for supporting the 2S module development and qualification.

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