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Mechanical Studies of Trays for the CMS MTD Barrel Timing Layer ANG LI, Univ of Virginia, CMS COLLABORATION — The Compact Muon Solenoid (CMS) detector at the CERN Large Hadron Collider (LHC) is undergoing an extensive Phase II upgrade program to prepare for the challenging conditions of the High-Luminosity LHC (HL-LHC). In particular, a new timing detector will measure minimum ionizing particles (MIPs) with a time resolution of ˜30-40 ps and hermetic coverage up to a pseudo-rapidity of $|\eta|$=3. The precision time information from this MIP Timing Detector (MTD) will reduce the effects of the high levels of pile-up expected at the HL-LHC and will bring new and unique capabilities to the CMS detector. The central Barrel Timing Layer (BTL) will be based on LYSO:Ce crystals read out with silicon photomultipliers (SiPMs). The BTL will use elongated crystal bars, with double-sided read out, with a SiPM on each end of the crystal, in order to maximize detector performance within the constraints of space, cost, and channel count. We will present an overview of the mechanical studies of the BTL design, as well as discuss the preparations for the assembly of the BTL, the majority of which will be built in the US.

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