Contribution ID: **50** Type: **not specified**

Tile Module Assembly for the CMS High Granularity Calorimeter at Fermilab

The upcoming High Luminosity LHC promises an integrated luminosity of 3000 fb⁻¹ by the end of its operation. The High Granularity Calorimeter (HGCAL) is the proposed solution to replace the calorimeter endcaps of the CMS detector. The HGCAL is the first 5D imaging calorimeter to be used in a collider physics experiment, designed to withstand radiation and handle large pileup through the full operation of the High Luminosity LHC. The HGCAL will be constructed with radiation-hard silicon sensors in the layers closest to the proton-proton interaction point and scintillator tile modules based on SiPM-on-Tile technology in the farther layers. Around 2000 of these tile modules will be assembled here at Fermilab, corresponding to about half of the detector. In this talk, I will discuss the construction and development of the pick-and-place machines utilized to achieve this assembly, other related assembly efforts at Fermilab, and plans for quality control during final production.

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Session Classification: Computational III