

JINR PARTICIPATION IN THE CONSTRUCTION AND UPGRADE OF CMS EXPERIMENT

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JINR contribution to CMS experiment is focused on the design, development, construction, operation and upgrade of the of the Endcap Hadron Calorimeter (HE) and the Forward station of the Muon system (ME1/1). Contributing to the CMS Computing, JINR provides robust operation of Tier-1 and Tier-2 centers. JINR staff take part in the experimental data taking, physical analysis and software development. During the first phase of CMS upgrade, aimed to the reliable work of detectors in the LHC design operating mode with energy $\sqrt{s} = 14$ TeV and instantaneous luminosity $L = 2 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$, HE calorimeter segmentation was increased, and electronics were replaced. Detectors of the Muon system operating in the region of the high background rates, were equipped with new fast readout electronics. The second phase of the CMS upgrade, where JINR is participating in the High Granularity Calorimeter (HGCAL) project and in the upgrade of the Endcap Muon system (ME), is aimed at ensuring reliable operation of the detectors in the High Luminosity LHC mode (HL-LHC) at energy $\sqrt{s} = 14$ TeV and instantaneous luminosity of $L = 5\text{--}7 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$.