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Study of Hadron Shower Development in the FHCal at the BM@N Experiment

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The Forward Hadron Calorimeter (FHCal) of the BM@N experiment at JINR, Dubna, is a compensated segmented calorimeter designed to measure heavy-ion collision centrality and reconstruct the reaction plane orientation. Its performance relies on the calorimeter's energy response to projectile spectators, where the deposited energy consists of both electromagnetic (e) and hadronic (h) shower components. The compensation ratio (e/h) is a key characteristic of hadron calorimeter, directly affecting its energy resolution and response linearity.

This study presents the method of decomposition of hadron shower into electromagnetic and hadronic components to estimate the e/h ratio. The proposed technique is implemented using GEANT4 simulations of primary hadrons (2–10 GeV) in a realistic detector geometry.

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