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Effect of muon-nuclear inelastic scattering on high-energy atmospheric muon spectrum at large depth underwater

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Abstract content

Energy spectra of hadron cascade showers produced by the cosmic ray muons travelling through water and the muon integral spectra underwater at the depth up to 4 km are calculated with two models of muon inelastic scattering on nuclei, the recent hybrid model (two-component, 2C) as well as the well-known generalized vector-meson-dominance (GVMD) model for the comparison. The 2C model involves photonuclear interactions at the low and moderate virtualities as well as the hard scattering including the weak neutral current processes. For the muon scattering off nuclei substantial nuclear effects, shadowing, EMC, Fermi motion of nucleons were taken into account. It is shown that deep underwater muon energy spectrum calculated with the 2C model are noticeably distorted at energies above 100 TeV as compared to that obtained with the GVMD model.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 5 (HE part 2), pages 1475-1478

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