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# Proton-air inelastic cross section measurement with ARGO-YBJ

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## Abstract content

Cosmic ray physics in the $10^{12}$-$10^{15}$ eV primary energy range is among the main scientific goals of the ARGO-YBJ experiment. The detector, located in the Cosmic Ray Observatory of Yangbajing (Tibet, China) at 4300m a.s.l., is a full coverage Extensive Air Shower array consisting of a carpet of Resistive Plate Chambers (RPC) of about $5800m^2$. The apparatus layout, performance and location offer a unique possibility to make a deep study of several characteristics of the hadronic component of the cosmic ray flux in an energy window marked by the transition from direct to indirect measurements. In this work the first results of the measurement of the interaction cross section between primary protons and air nuclei will be reported. The analysis is based on the different flux attenuation for different atmospheric depths (i.e. zenith angles) by exploiting the unique detector capabilities in selecting the shower development stage by means of the size, hit density and both time and lateral profile measurements. The systematics introduced by shower fluctuations and heavier primaries have been also considered. The new measurements will give useful insights in an energy region with scanty experimental data and where nuclear interaction models start to give sizeably different expectations.

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

ARGO-YBJ 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. 4 (HE part 1), pages 675-678

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