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Calibration of the RPC charge readout in the ARGO-YBJ experiment

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In the ARGO-YBJ experiment, the charge readout is performed on two Big Pads equipped in each RPC to measure the charged particle density of the shower front up to 104/m2, enabling the study of primaries with energies in the "Knee" region. It's the first time for RPCs being used this way. To calibrate the number of charged particles injected on one RPC versus its charge readout, a telescope is setup with RPCs to be calibrated and scintillation detectors to measure the number of injected charged particles. Shower secondary particles are taken as the calibration beam. The telescope was tested at sea level and then moved to ARGO-YBJ site for coincident operation with ARGO-YBJ experiment. The charge readout shows good linearity with the particle density in the dynamic range. Using the data of the ARGO-YBJ experiment, all the Big Pads can be calibrated relatively to that of the RPCs in the telescope, thus the absolute calibration is propagated to the whole array.

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