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Check-Sort-Push protocol in CMS iRPC/RPC data compression/decompression and transmission and its application in Backend electronics system (BY ZOOM))

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To provide better cluster position resolution a new iRPC with two-ends readout and upgraded LinkSystem in CMS RPC detector will be used to provide timing information together with hit information. Different from present CMS RPC system where a partition has been used in data compression and decompression before data transmission and after reception respectively [1], so a new compression/decompression has to be used and a so-called Check-Sort-Push protocol was proposed as in reference [2]. This talk will describe the principle of the Check-Sort-Push mechanism and some simulation, presents data analysis and results from joint test and cosmic-ray data taking with iRPC detector/FEE complex demonstrating a successful working backend system for the new iRPC detector. Some results showing the necessity and importance of the application of this Check-Sort-Push protocol in the final system will also be presented.

[1] M. Gorski et al./Nucl. Instr. and Meth. in Phys. Res. A 419 (1998) 701—706
[2]https://indico.cern.ch/event/967463/contributions/4071622/attachments/2126016/3579438/RPC_electronic_meeting_20201020.pdf

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