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Online/Offline reconstruction of trigger-less readout in the R3B experiment at FAIR

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The R3B (Reactions with Rare Radioactive Beams) experiment is one of the planned experiments at the future FAIR facility at GSI Darmstadt. R3B will cover experimental reaction studies with exotic nuclei far off stability, thus enabling a broad physics programs with rare-isotope beams with emphasis on nuclear structure and dynamics. Several different detection subsystems as well as sophisticated DAQ system and data-analysis software are being developed for this purpose.
The data analysis software for R3B is based on FairRoot framework and called R3BRoot. R3BRoot is being used for simulation and detector design studies for the last few years. Recently, it was successfully used directly with the data acquisition and for the analysis of the R3B test beam-time in April 2014. For the future beam times the framework has to deal with the free streaming readout of the detectors. The implementation within R3BRoot to fulfill this trigger-less run mode will be presented as well as the set of tools developed for the online reconstruction and quality assurance of the data during the run.

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