Performance of the ALICE Fast Interaction Trigger Detector

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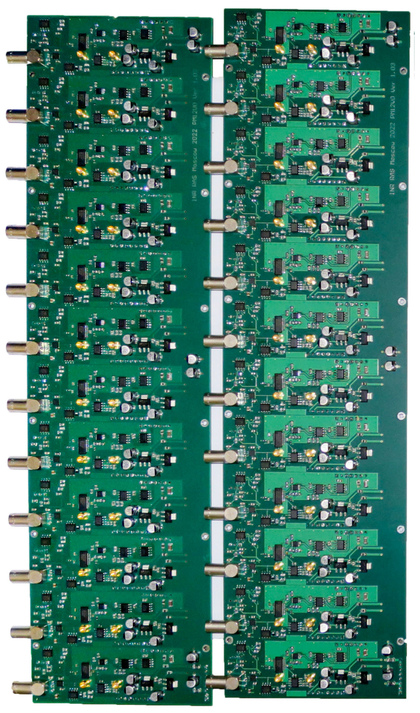
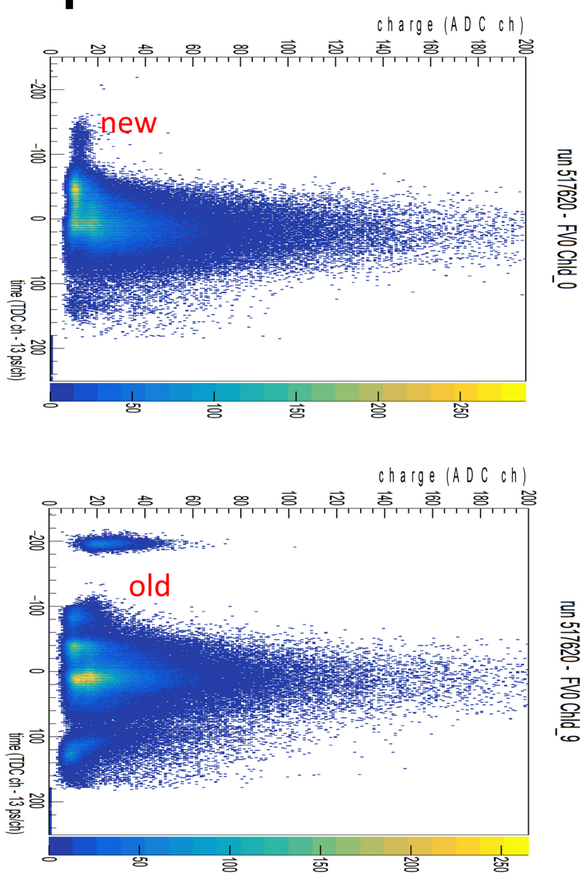
Required functionality

- Fast min. bias collision trigger with latency < 425 ns;
- Collision time for TOF with ~ 20 ps time resolution;
- Luminosity and background monitor;
- Centrality measurement;
- Event plane determination;

FV0 Electronics performance



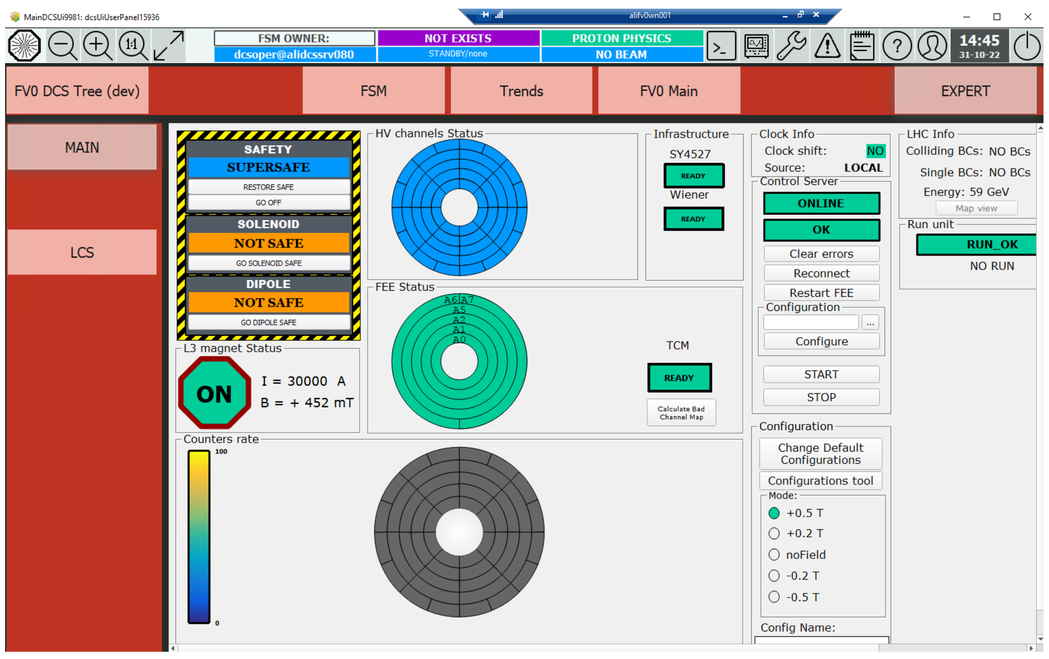
new custom made mezzanine boards



New mezzanine performance for FV0 and FDD for Pb-Pb run:

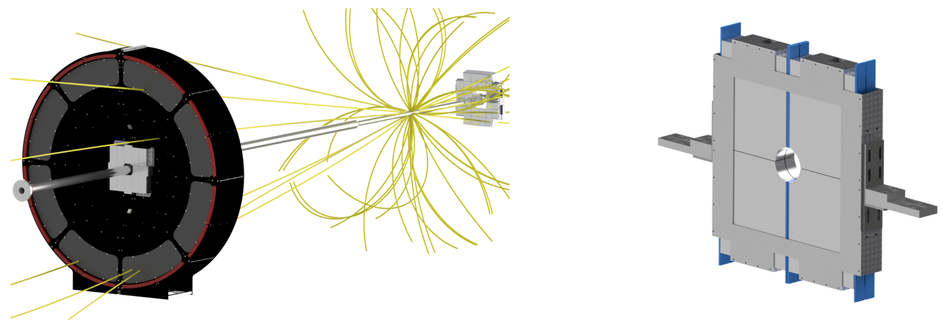
- 25% amplitude resolution improvement for 1 MIP;
- 60% trigger efficiency for 1 MIP events;

FIT Detector Control System



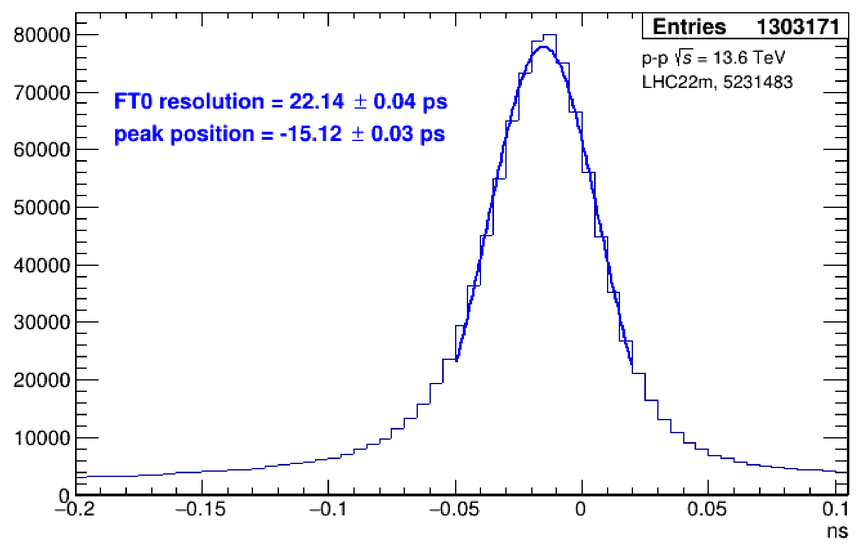
- The Detector Control System for ALICE-FIT-FT0 has been upgraded, and many processes were automated;
- The DCS system has been developed for all FIT detectors;
- The Alice_DCSUI was implemented into FV0 and FDD projects;

FIT Detectors

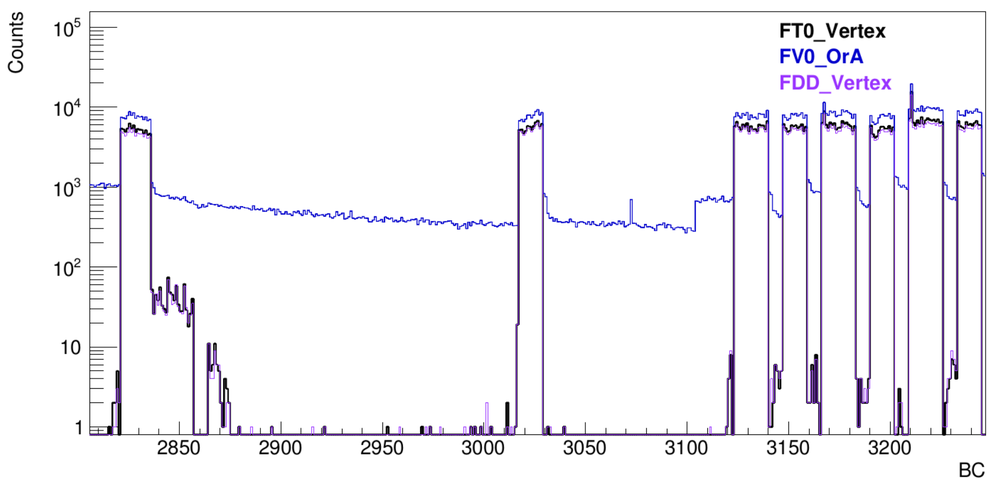


FIT-Diffractive Detector (FDD): Scintillator	-19.5 m (-6.9 < η < -4.9) and 17 m (4.7 < η < 6.3,) from IP
FIT-T0 (FT0): Cherenkov	-0.8 m (-3.4 < η < -2.3) and
FIT-V0 (FV0): Scintillator	3.3 m (3.8 < η < 5) from IP 3.3 m (2.2 < η < 5.1, 3.2) from IP

Results from pp collisions in 2022

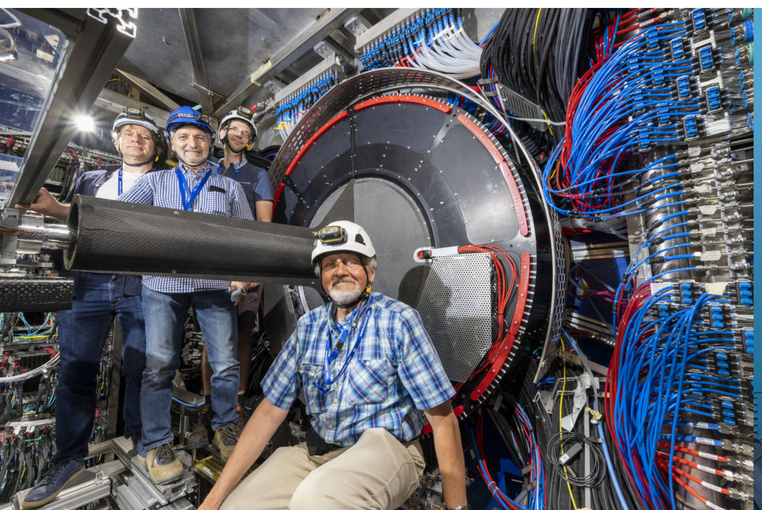


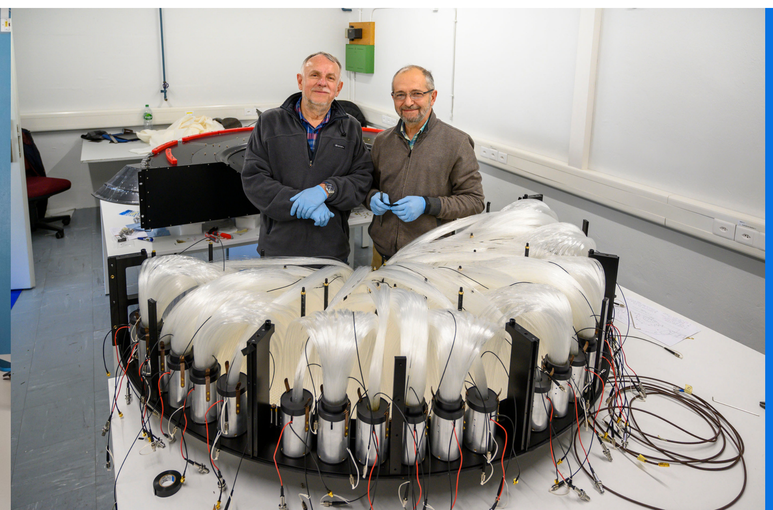
Trigger rates FT0_VX, FV0_ORA, FDD_VX



Conclusions

- All FIT design goals have been reached;
- The modified mezzanine boards improved the scintillator detectors' time distribution;
- The DCS of all FIT sub-systems has been developed and significantly automatized;
- FT0 has reached 22 ps time resolution in pp collisions;
- FIT FT0VX trigger serves as the ALICE luminosity monitor;
- FT0 rates from non-colliding bunches indicate beam-gas background in ALICE;





LHCC 2022 poster session