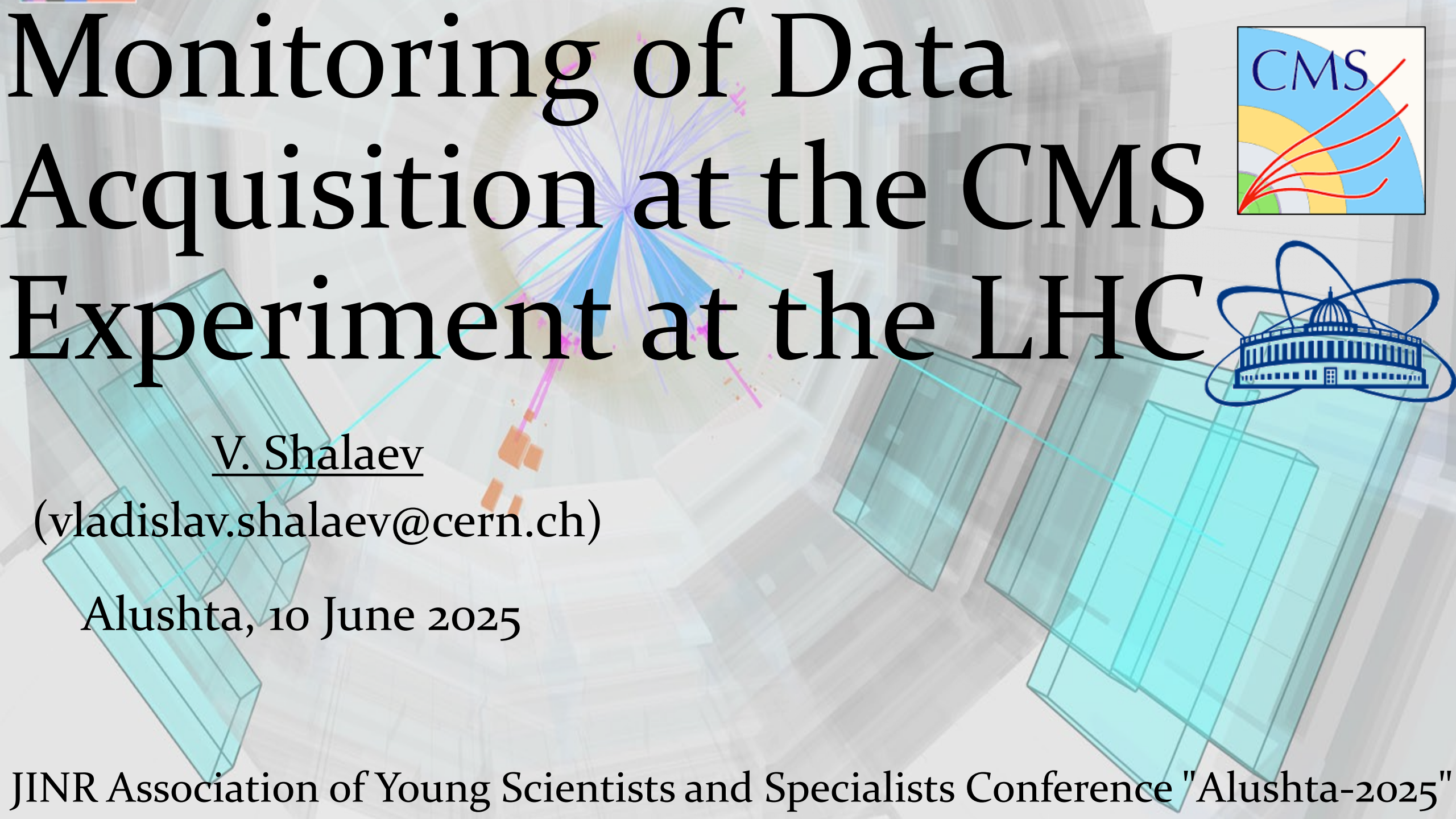
Monitoring of Data Acquisition at the CMS Experiment at the LHC



V. Shalaev

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Alushta, 10 June 2025

JINR Association of Young Scientists and Specialists Conference "Alushta-2025"

Collected Statistics and Data Hierarchy

- Run 1 (2010 – 2012)

$\sqrt{s} = 7 - 8$ TeV

$L_{int} = 29.4\ fb^{-1}$

- Run 2 (2015 – 2018)

$\sqrt{s} = 13$ TeV

$L_{int} = 163.6\ fb^{-1}$

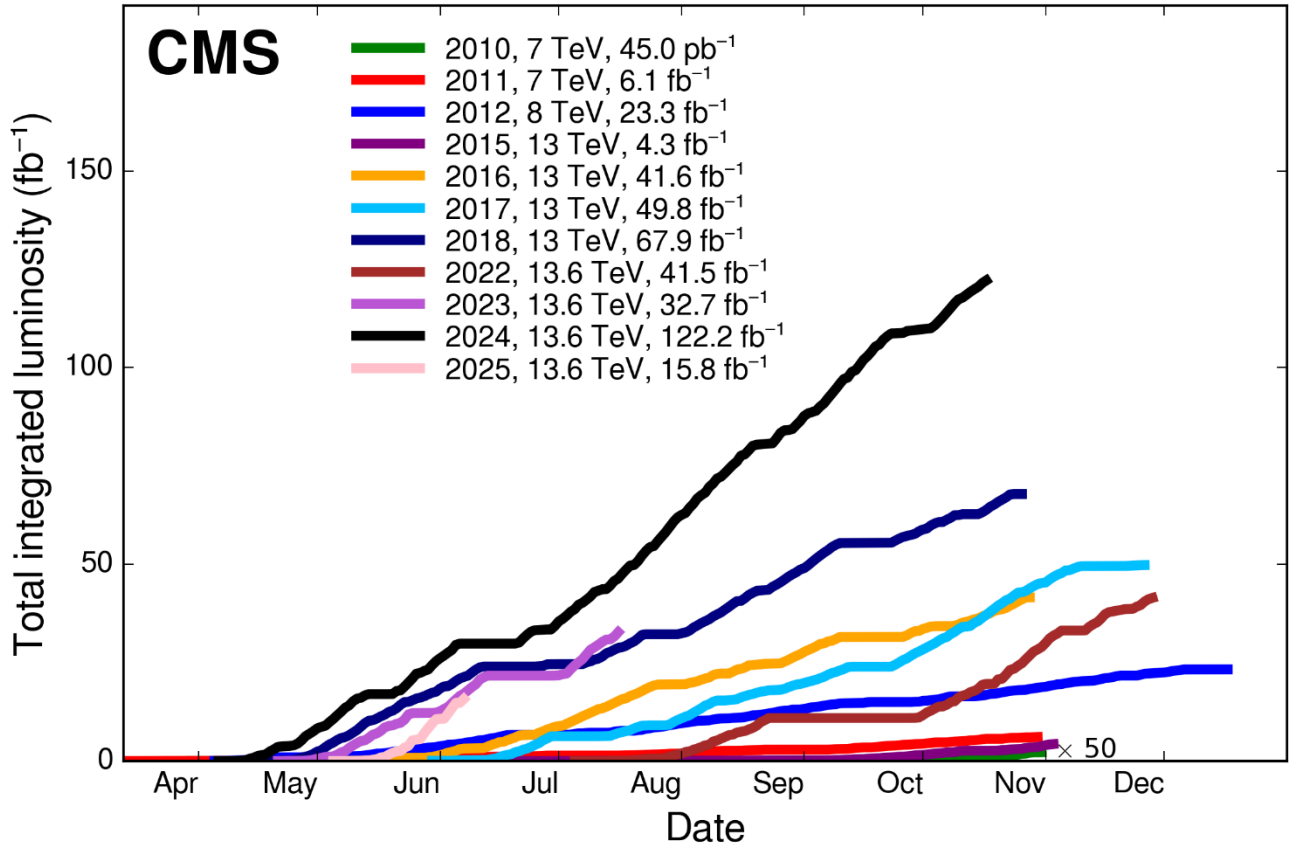
- Run 3 (2022 –2026)

$\sqrt{s} = 13.6$ TeV

$L_{int} = 212.2\ fb^{-1}$

Total $L_{int} = 405.2\ fb^{-1}$

https://twiki.cern.ch/twiki/bin/view/CMSPublic/LumiPublicResults



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Splitted by annual shutdown. Significant changes may happens

Years (2016, 2017..)

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Years (2016, 2017..)

Eras (A,B,C,D..)

May be splitted because of changes in algorithms

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Splitted by beam injections

Years (2016, 2017..) — Eras (A,B,C,D..) — Fills

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Years (2016, 2017..)

Eras (A,B,C,D..)

Fills

Runs

Splitted by changes in acquisition mode or beam dump

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Years (2016, 2017..)

Eras (A,B,C,D..)

Fills

Runs

Lumisections

Periods of data acquisition 23 sec.

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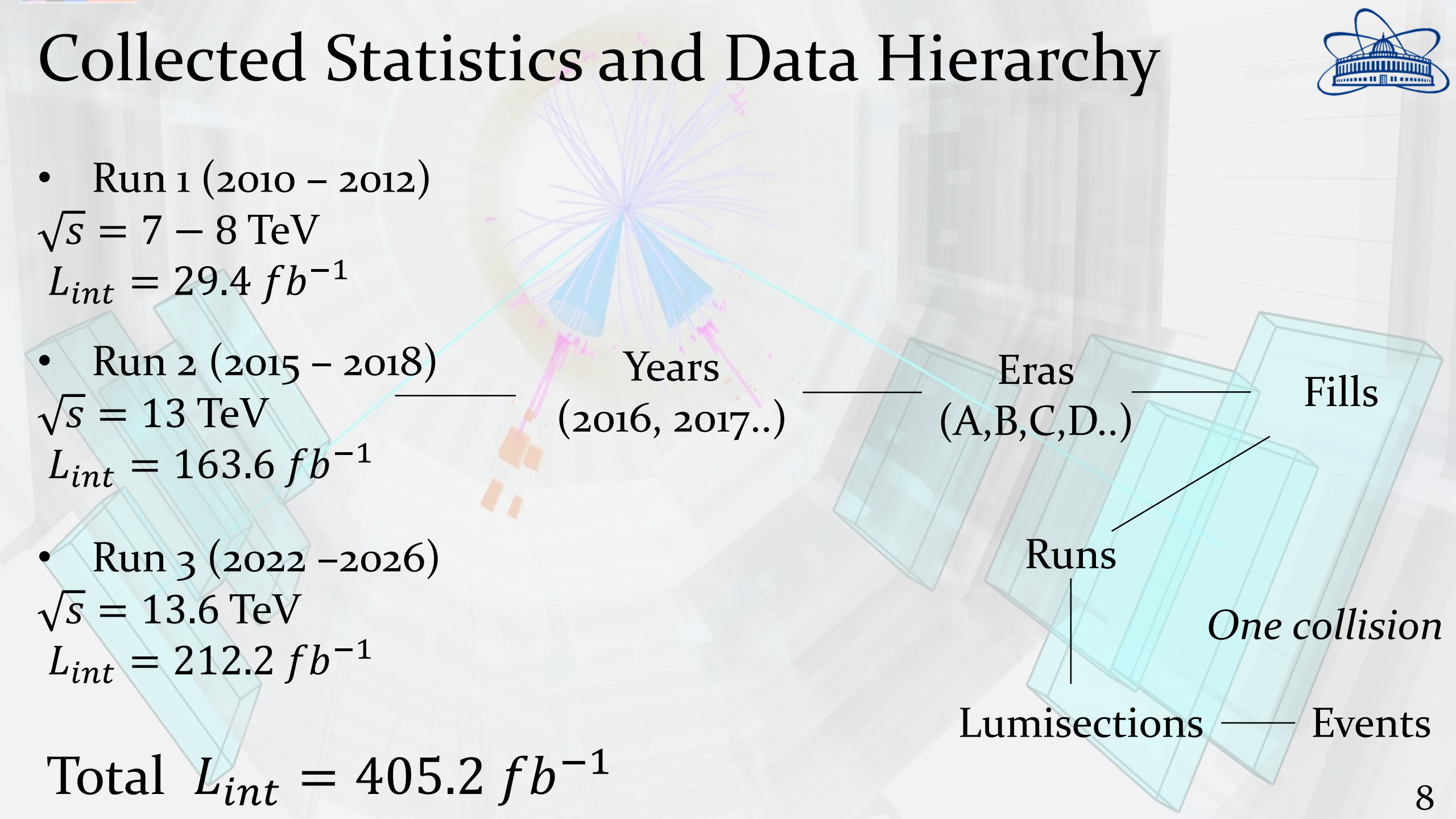

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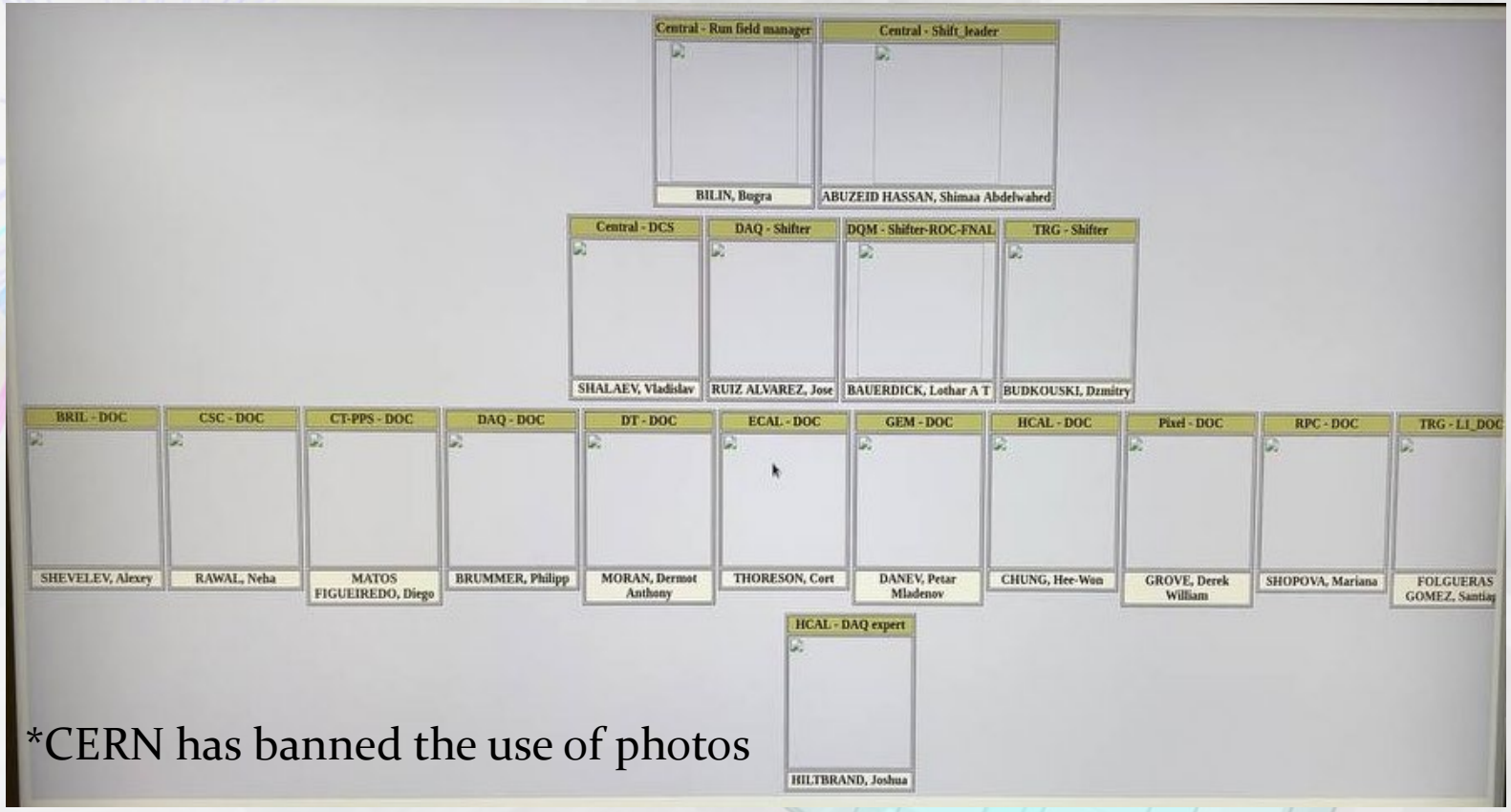
Teams of LHC detectors Struggle for each second of collider work

Who Perform The Monitoring

<u>Central shift crew (8 h. shift):</u>

- Shift Leader
- Technical Shifter
- L1 Trigger Shifter
- Data acquisition (DAQ) Shifter
- Data Quality Monitoring (DQM) Shifter



*CERN has banned the use of photos

<u>Remote (on-call Shifts):</u>

- Detector on Call (12 pers.)
- Run Field Manager (RFM)

Each institute that takes part in the experiment must contribute to the central shifts and earn shift points proportionally to the number of authors

Conclusions

JINR shift crew constantly participates in Run 3 CMS central shifts.

In this year **216 CSP** were earned by JINR shift team:

- Budkouskiy Dzmitriy (LBHEP)
- Zhizhin Ilia (LBHEP)
- Shalaev Vladislav (LBHEP)
- Slizhevskiy Kirill (MLIT)
- Korsakov Uriy (MLIT)

The annual quota for our institute was complited. (2022 -2025*)

We plan to continue participate in CMS central shifts in 2026.