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Data Center Environmental Sensor for safeguarding the CERN Data Archive

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CERN has been archiving data on tapes in its Computer Center for decades and its archive system is now holding more than 135 PB of HEP data in its premises on high density tapes.

For the last 20 years, tape areal bit density has been doubling every 30 months, closely following HEP data growth trends. During this period, bits on the tape magnetic substrate have been shrinking exponentially; today's bits are now smaller than most airborne dust particles or even bacteria. Therefore tape media is now more sensitive to contamination from airborne dust particles that can land on the rollers, reels or heads.

These can cause scratches on the tape media as it is being mounted or wound on the tape drive resulting in the loss of significant amounts of data.

To mitigate this threat, CERN has prototyped and built custom environmental sensors that are hosted in the production tape libraries, sampling the same airflow as the surrounding drives. This paper will expose the problems and challenges we are facing and the solutions we developed in production to better monitor CERN Computer Center environment in tape libraries and to limit the impact of airborne particles on the LHC data.

Tertiary Keyword (Optional)

Monitoring

Primary Keyword (Mandatory)

Storage systems

Secondary Keyword (Optional)

Preservation of analysis and data

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