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LiDAR-based 3D scanning for accurate infrastructure modeling at MAX IV

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This project explores the use of advanced 3D scanning technology at MAX IV, focusing on the Leica RTC360 scanner to capture high-precision scans of accelerator tunnels and restricted beamline areas. Known for its rapid scanning and accuracy (1.9mm at 10m), the RTC360 generates detailed 3D models of these complex environments. The goal is to produce accurate digital representations to aid in maintenance, structural assessments, and long-term planning. To improve scan data positioning, it can be best-fitted to a reference network of points measured with laser tracker instrumentation, ensuring precise alignment reference. This integration enables overlaying scan data with CAD models, linking the physical environment to its design representation. Using the RTC360's LiDAR technology, the project ensures efficient data capture in hard-to-reach areas, supporting enhanced analysis and decision-making. The resulting 3D models can improve workflow and provide stakeholders with valuable insights into the condition of MAX IV infrastructure, supporting current and future operational needs.

Footnotes

Funding Agency

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