



Contribution ID: 556 Contribution code: SUP061

Type: Poster Presentation

## Data-Driven Modeling for Collider Luminosity Prediction

*Sunday 10 August 2025 15:00 (3 hours)*

This work explores the application of machine learning methods to predict the luminosity of the VEPP-4M electron-positron collider. Historical data collected during operation are used to train and evaluate several machine learning models. A comparative analysis is conducted to assess the performance of different modeling approaches. The study aims to investigate whether data-driven methods can effectively capture the complex relationships between collider conditions and luminosity. The results indicate that machine learning can serve as a complementary tool for understanding and monitoring collider behavior. This approach is relevant in the context of growing interest in automation, instant diagnostics and predictive analytics in accelerator operations.

**Please consider my poster for contributed oral presentation**

Yes

**Would you like to submit this poster in student poster session on Sunday (August 10th)**

Yes

**Footnotes**

**Funding Agency**

**I have read and accept the Privacy Policy Statement**

Yes

**Author:** MAMUTOV, Rasim (Russian Academy of Sciences)

**Co-author:** BARANOV, Grigory (Budker Institute of Nuclear Physics)

**Presenter:** MAMUTOV, Rasim (Russian Academy of Sciences)

**Session Classification:** SUP: Sunday Student Poster Session

**Track Classification:** MC6 - Beam Instrumentation, Controls, AI/ML, and Operational Aspects