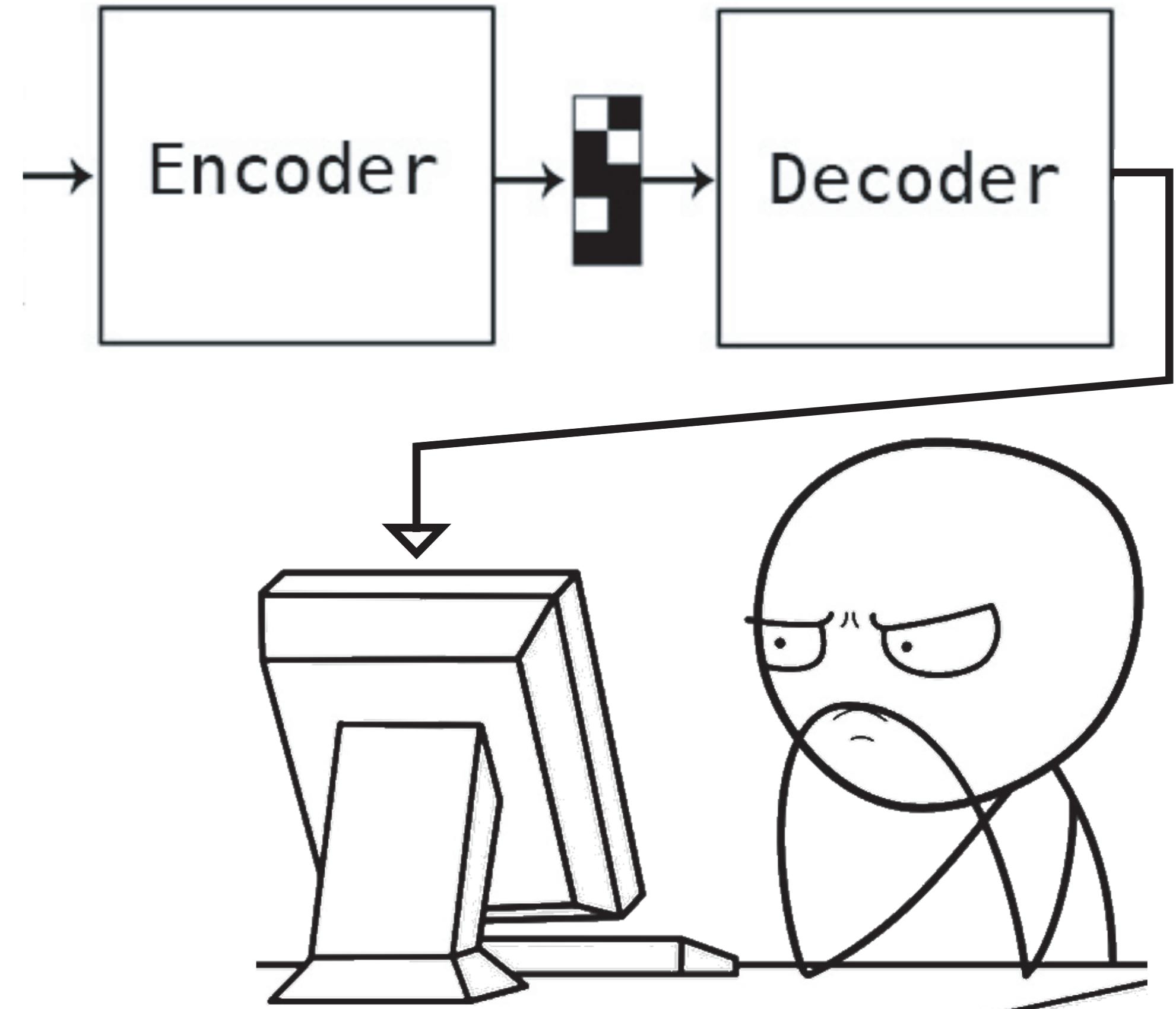


A Reconfigurable Neural Network ASIC for Front-end Data Compression at HL-LHC



*Encoder graphics obtained from arXiv:2105.01683

As experiments become more powerful/sensitive:

- amount of data required to be transmitted increases
- conventional data transmission methods become less effective

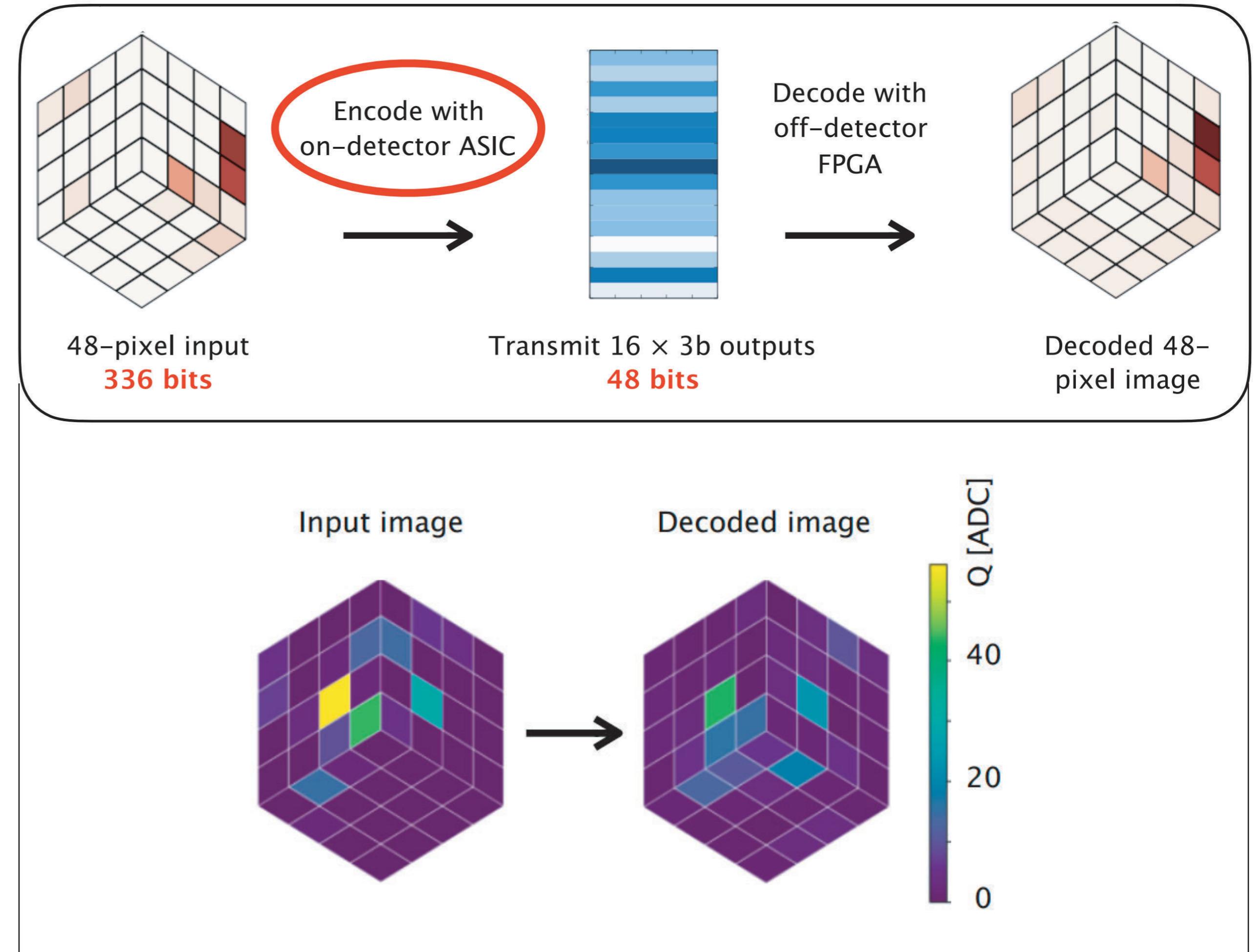
Machine learning methods have yet to be used in developing data compression algorithms, but may be able to remedy this issue

Project specifically considers data transport from front-end ASIC's (Application Specific Integrated Circuit) to back-end FPGA's (Field-Programmable Gate Array) for the high-granularity endcap calorimeter (HGCal)

Description Continued

-Benefit of using Machine Learning is that data compression can be customized based on event type or location in detector

-Compression performance quantified by *Energy Mover's Distance* (energy x distance)

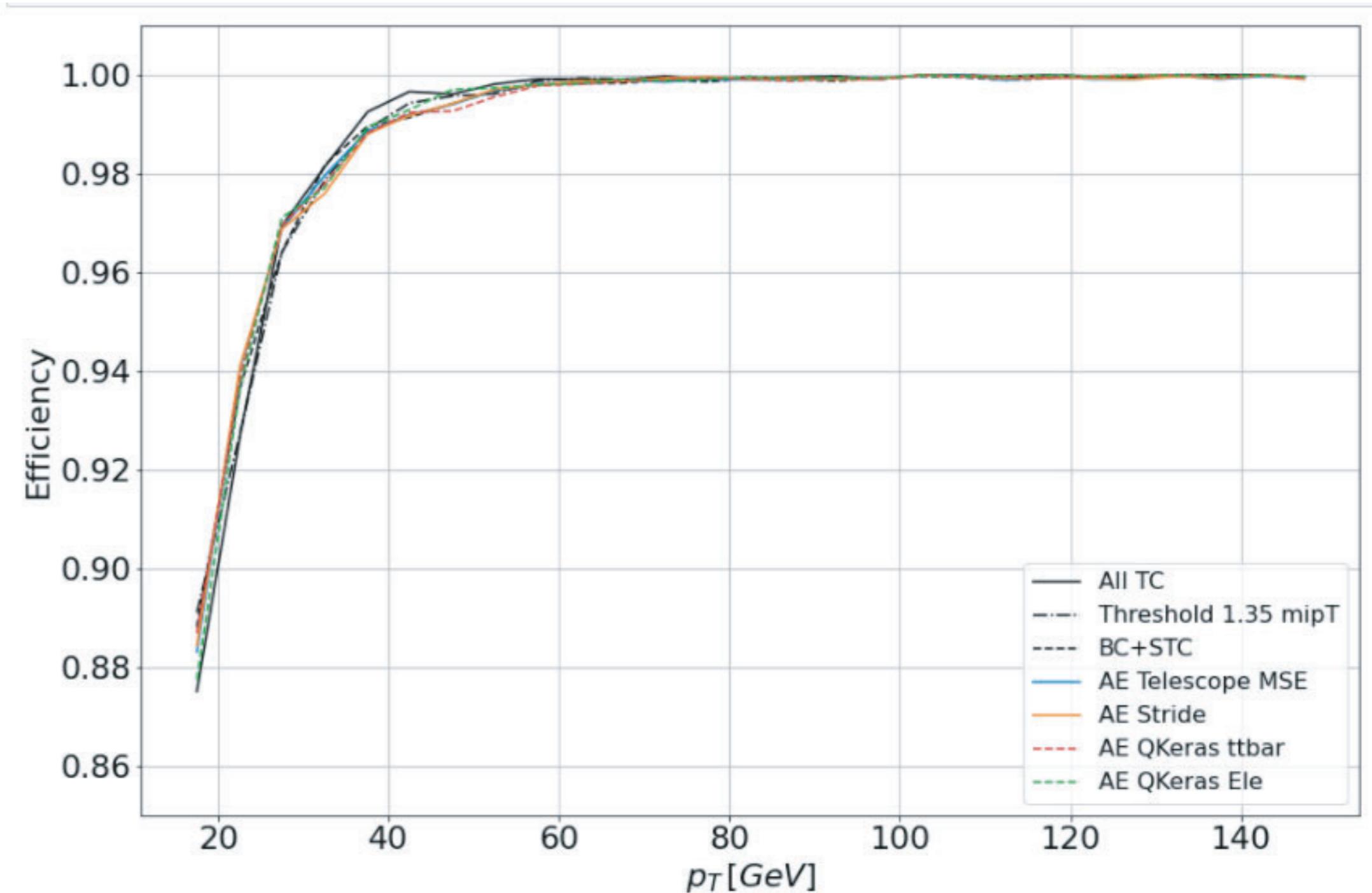


Role

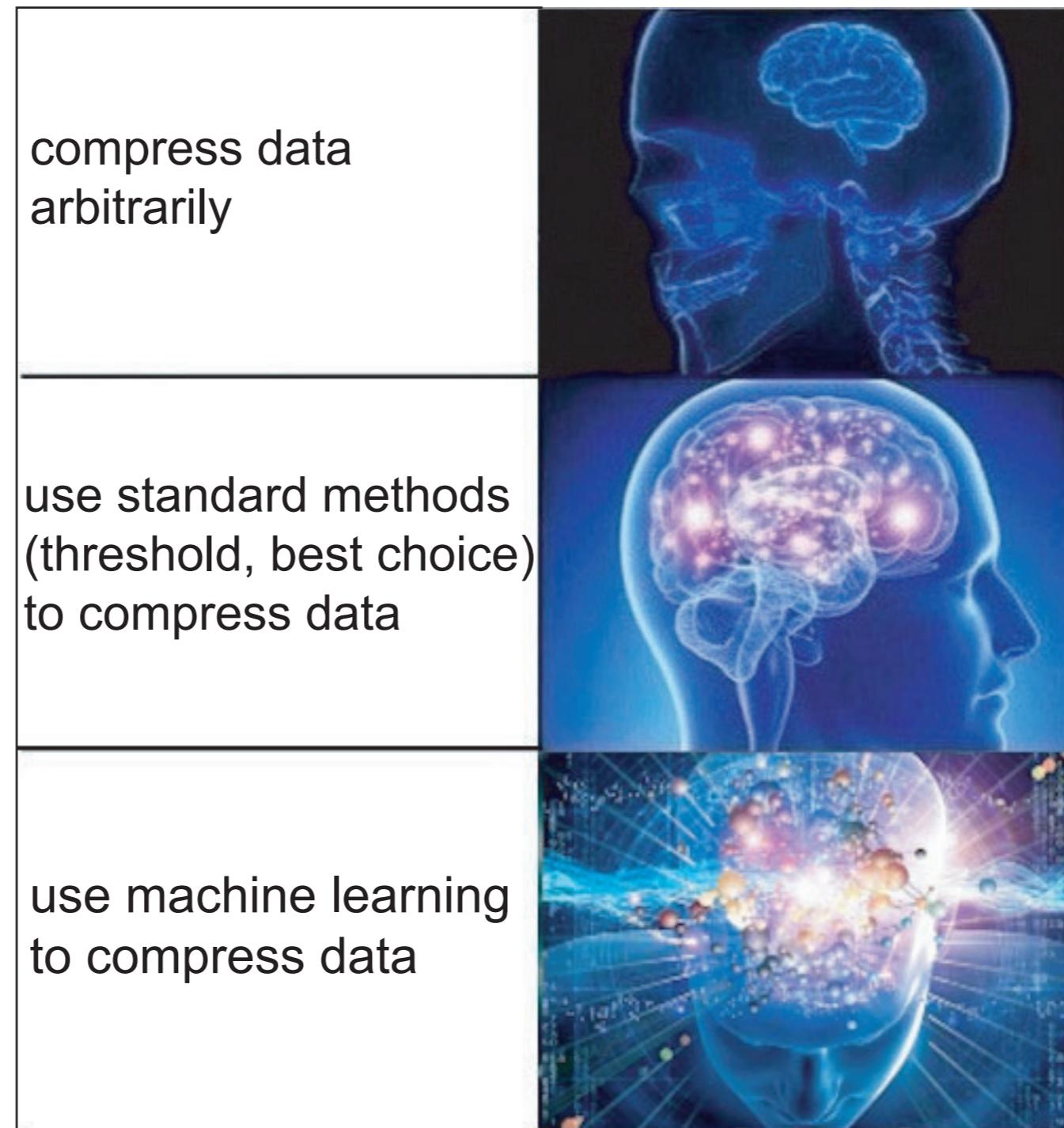
- Help quantify and present ‘physics performance’ of Machine Learning methods used in this study.

Progress

- Ran training program (i.e. what determines compression parameters) and obtained preliminary models
- Investigated ROOT files obtained from training program



- Develop plotting scripts to analyze various recorded quantities
- Report on preliminary models/distributions to group



My (Adobe) Travels

