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## PIPPIN: Generating variable length full events from partons

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We present a novel approach for directly generating full events at detector-level from parton-level information, leveraging cutting-edge machine learning techniques. To address the challenge of multiplicity variations between parton and reconstructed object spaces, we employ transformers, score-based models and normalizing flows. Our method tackles the inherent complexities of the stochastic transition between these two spaces and achieves remarkably accurate results. This research contributes to the ongoing efforts in high-energy physics and generative modelling, providing a promising avenue for enhanced precision in fast detector simulation. The combination of innovative techniques and the achieved accuracy highlights the potential of our approach in advancing the field and opens avenues for further exploration.

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