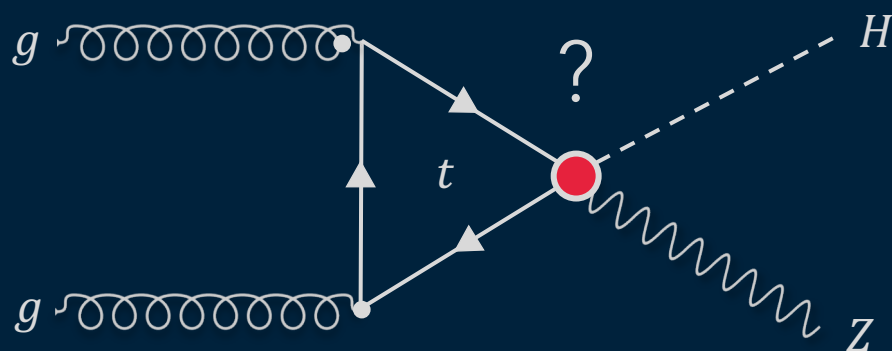


Towards the First Time Measurement of $gg \rightarrow ZH$ at the LHC Using Transformer Networks

Geoffrey Gilles, Wouter Verkerke, Marcel Vreeswijk

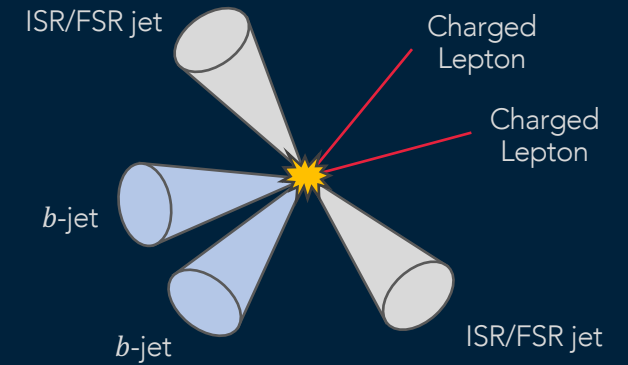
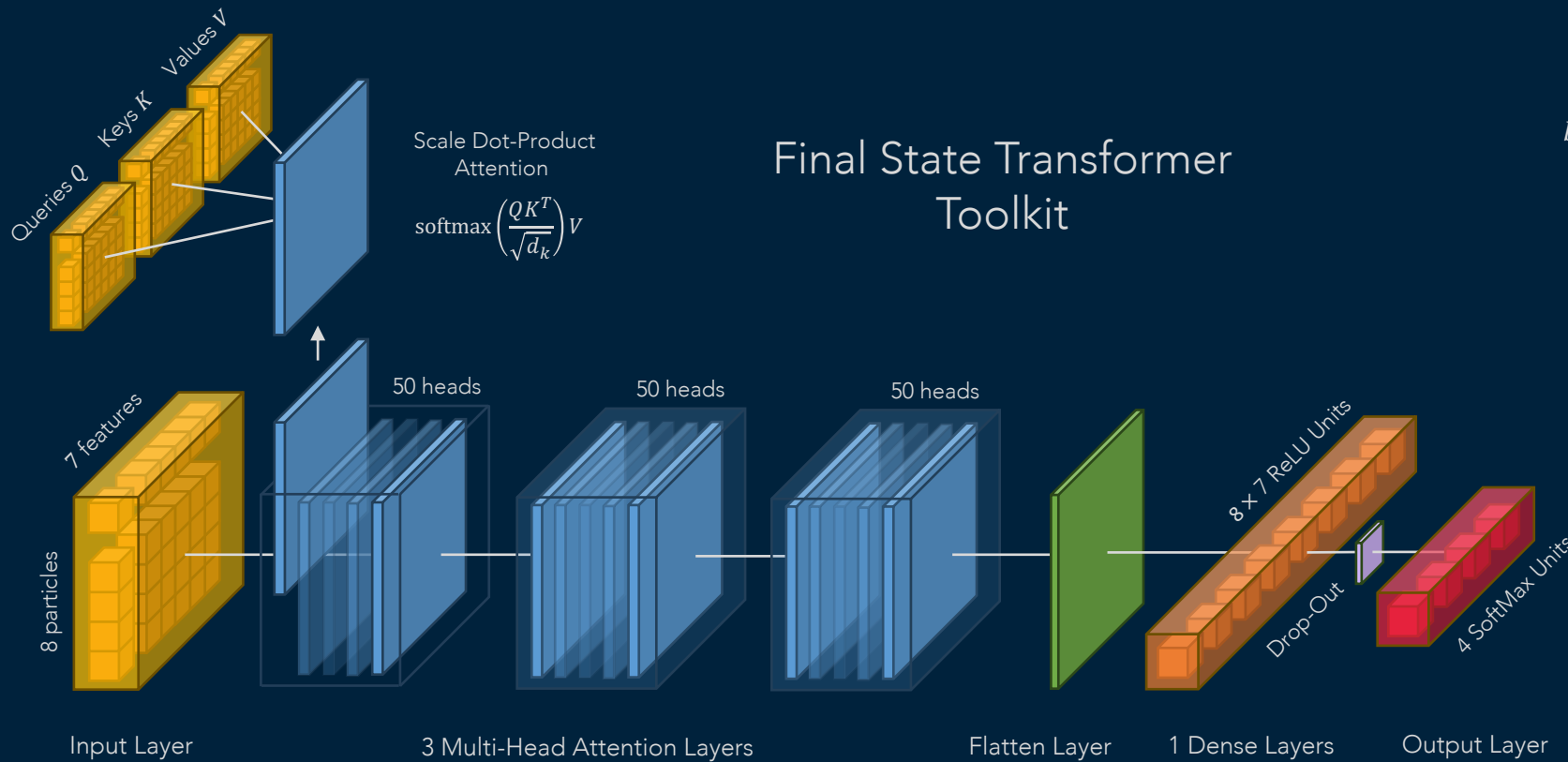
Extract New Physics Contributions from the Challenging $gg \rightarrow ZH$ process



Simulation Based Inference
empowered by
Transformer network

Towards the First Time Measurement of $gg \rightarrow ZH$ at the LHC Using Transformer Networks

Learning from Particle Collision Event Final State

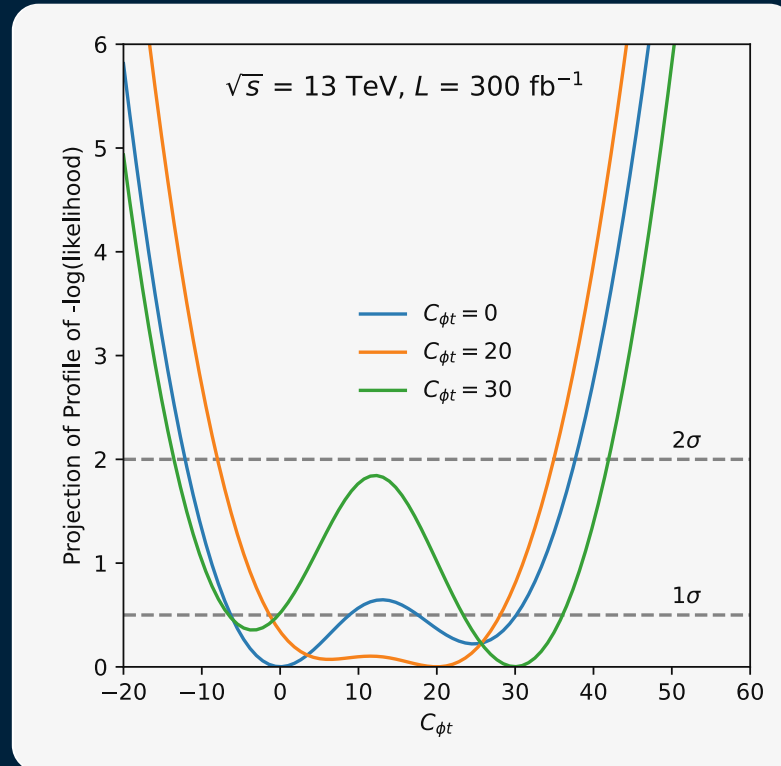


Discriminate signal from background
 &
 Assess new physics contributions

Exploring Simulation Based Inference

Construct likelihood function
based on Transformer
output probabilities

$$\begin{aligned} \mathcal{L} = & P_{obs}^{SM} \\ & + c_{\phi t} \cdot P_{obs}^{INT} \\ & + c_{\phi t}^2 \cdot P_{obs}^{QUA} \\ & + \mu_{BKG} \cdot P_{obs}^{BKG} \end{aligned}$$



Capture intricacies of
new physics interaction
and detector responses
in unprecedented details

Towards the First Time Measurement of
 $gg \rightarrow ZH$ at the LHC Using Transformer Networks

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