Contribution ID: **230** Type: **Talk**

Equivariant neural networks for robust CP observables

Wednesday 4 September 2024 10:00 (30 minutes)

We introduce the usage of equivariant neural networks in the search for violations of the charge-parity (CP) symmetry in particle interactions at the CERN Large Hadron Collider. We design neural networks that take as inputs kinematic information of recorded events and that transform equivariantly under the a symmetry group related to the CP transformation. We show that this algorithm allows to define observables reflecting the properties of the CP symmetry, showcasing its performance in several reference processes in top quark and electroweak physics. Imposing equivariance as an inductive bias in the algorithm improves the numerical convergence properties with respect to other methods that do not rely on equivariance and allows to construct optimal observables that significantly improve the state-of-the-art methodology in the searches considered. More details can be found at https://arxiv.org/abs/2405.13524.

Internet talk

No

Is this an abstract from experimental collaboration?

No

Name of experiment and experimental site

Is the speaker for that presentation defined?

Yes

Details

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Session Classification: Special Session on Machine Learning

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