

Learning to Discover A Broad Resonance: Have We Learned Any Unexpected

Broad resonances are generic predictions of many BSMs. But their discovery is expected to be challenging at the LHC and future collider experiments. It is because traditional resonance searches are based on the invariant mass distribution that will not be sharp enough for a broad resonance.

We used the deep neural network to develop a method to discover broad resonances at collider experiments. The network remarkably revealed that the invariant mass is still one of the most useful observables, but in addition that there are significantly more information used in the optimal network. Extracting what the network had learned, we present the implications on (broad) resonance searches.

Primary author: Prof. JUNG, Sunghoon (Seoul National University)

Co-authors: LEE, Dongsub (Seoul National University); XIE, Ke-Pan (Seoul National University)

Presenter: Prof. JUNG, Sunghoon (Seoul National University)

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