

## The discovery of the odderon by the D0 and TOTEM collaborations

*Tuesday, November 9, 2021 3:30 PM (30 minutes)*

We will describe the odderon discovery by the TOTEM and D0 experiments. The analysis compares the  $p\bar{p}$  elastic cross section as measured by the D0 Collaboration at a center-of-mass energy of 1.96 TeV to that in  $pp$  collisions as measured by the TOTEM Collaboration at 2.76, 7, 8, and 13 TeV. The two data sets disagree at the 3.4 sigma level and thus provide evidence for the t-channel exchange of a colorless, C-odd gluonic compound, also known as the odderon. We combine these results with a TOTEM analysis of the same C-odd exchange based on the total cross section and the ratio of the real to imaginary parts of the forward elastic strong interaction scattering amplitude in  $pp$  scattering, leading to a combined significance larger than 5 sigma.

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