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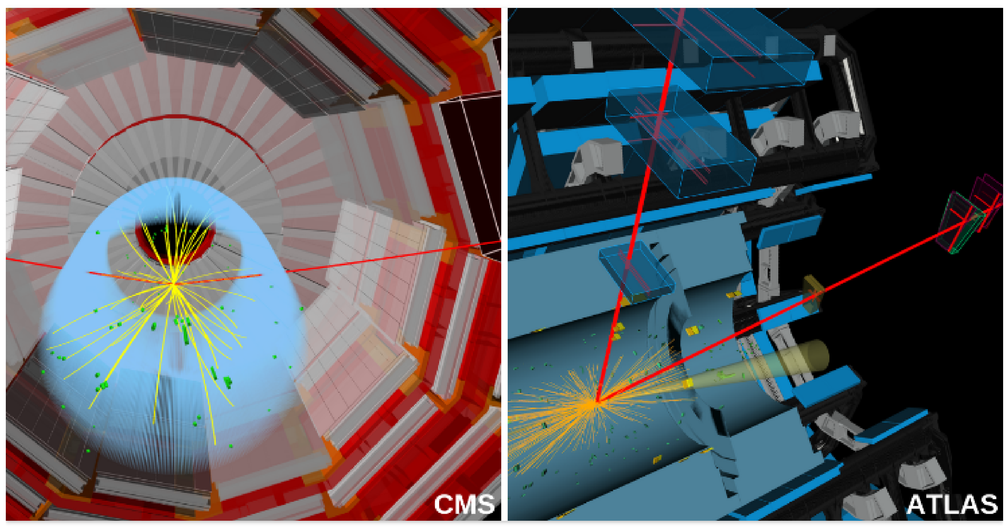
Leptoquarks, the Higgs boson and the muon's magnetism

A new study shows that a class of new unknown particles that could account for the muon's magnetism, known as leptoquarks, could also affect the Higgs boson's transformation into muons

14 JUNE, 2021 | By Ana Lopes



In a paper accepted for publication in *Physical Review Letters*, a trio of theorists including Andreas Crivellin of CERN shows that a class of new unknown particles that could account for the muon anomaly, known as leptoquarks, could also affect the transformation, or "decay", of the Higgs boson into muons.

Leptoquarks are hypothetical particles that connect quarks and leptons, the two types of particles that make up matter at the most fundamental level. They are a popular explanation for the muon anomaly and other anomalies seen in certain decays of particles called B mesons.

In their new study, Crivellin and his colleagues explored how two kinds of leptoquarks that could explain the muon anomaly would affect the rare decay of the Higgs boson into muons, of which the ATLAS and CMS experiments recently obtained the first indications.

They found that one of the two kinds of leptoquarks increases the rate at which this Higgs decay takes place, while the other one decreases it.

"The current measurements of the Higgs decay to muons are not sufficient to see this increase or decrease, and the muon anomaly has yet to be confirmed," says Crivellin. "But if future measurements, at the LHC or future colliders, display such a change, and the muon anomaly is confirmed, it will be possible to pick out which of the two kinds of leptoquarks would be more likely to explain the muon anomaly."

Higgs boson | muon | magnetic moment

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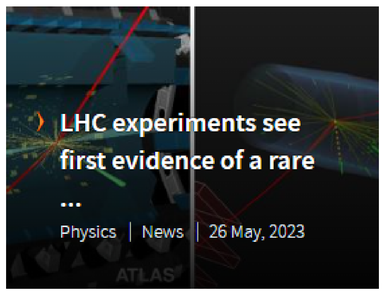

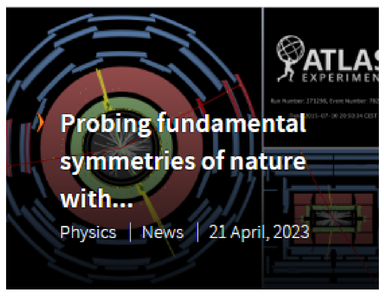

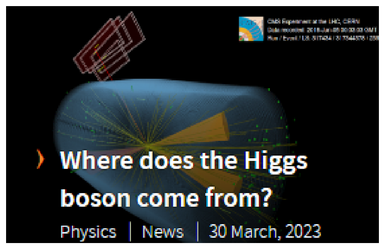

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