Recent study predicts that Higgs particles are much heavier than earlier observation

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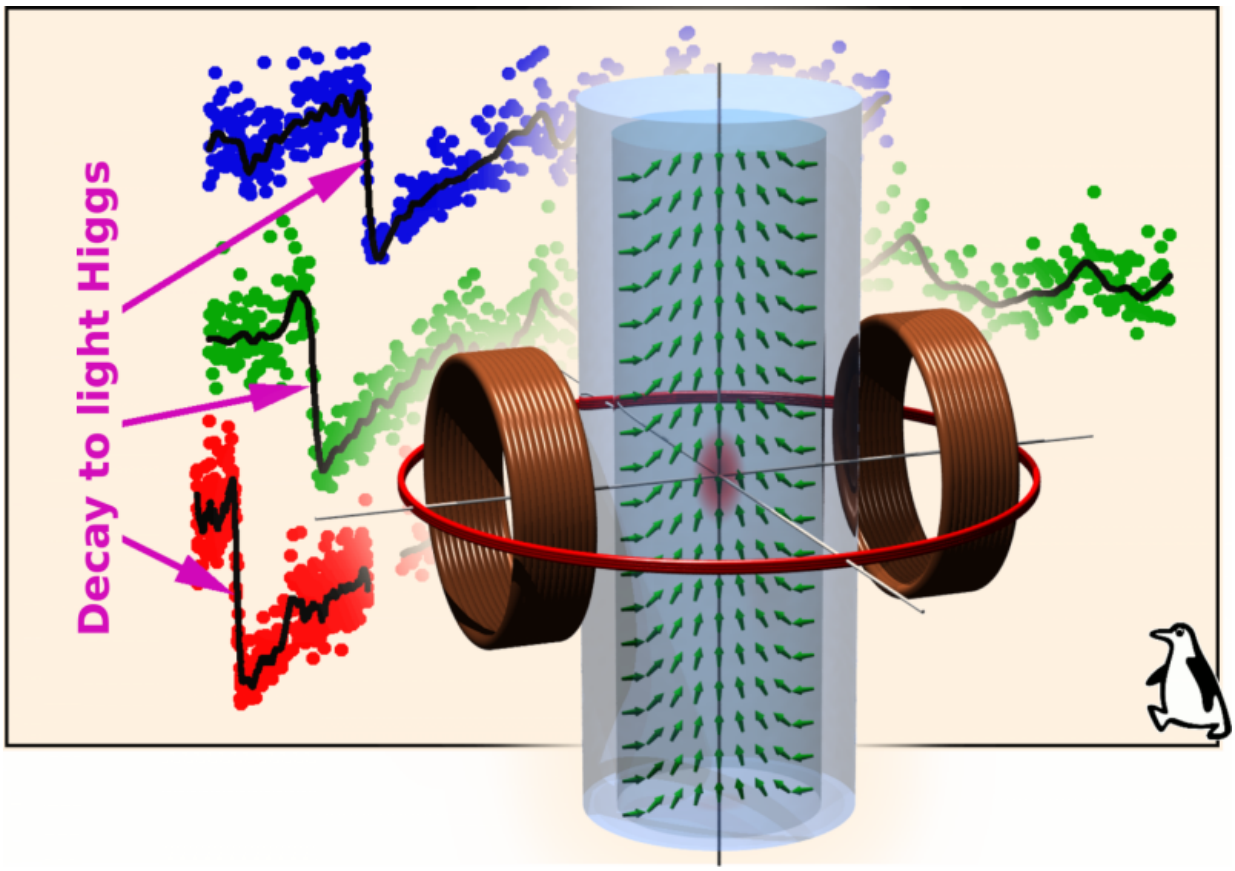

Helium-3 experimental cell and extract of data showing creation of light Higgs mode (analog of 125 GeV Higgs boson). Credit: Dr. Vladislav Zavyalov, Low Temperature Laboratory, Aalto University

In 2012, a proposed observation of the Higgs boson was reported at the

Large Hadron Collider in CERN. The observation has puzzled the physics community, as the mass of the observed particle, 125 GeV, looks lighter than the expected energy scale, about 1 TeV.

Researchers at Aalto University in Finland now propose that there is more than one Higgs boson, and they are much heavier than the 2012 observation. The results were recently published in *Nature Communications*.

"Our recent ultra-low temperature experiments on superfluid helium (3He) suggest an explanation why the Higgs boson observed at CERN appears to be too light. By using the superfluid helium analogy, we have predicted that there should be other Higgs bosons, which are much heavier (about 1 TeV) than previously observed," says Professor (emeritus) Grigory E. Volovik.

Prof. Volovik holds a position in the Low Temperature Laboratory at Aalto University and in Landau Institute, Moscow. He has received the international Simon Prize in 2004 for distinguished work in theoretical low temperature physics, and the Lars Onsager Prize in 2014 for outstanding research in theoretical statistical physics.

At the same time, the new CERN experiments have shown evidence of the second Higgs in just the suggested region (at 0.75 TeV). This evidence has immediately been commented and discussed in a large number of papers submitted to arXiv, an e-print service widely utilised by the physics community to distribute manuscripts of their unpublished work.

More information: V. V. Zavjalov et al. Light Higgs channel of the resonant decay of magnon condensate in superfluid 3He-B, *Nature Communications* (2016). DOI: 10.1038/NCOMMS10294

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