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Observation of Higgs Boson Decay to Bottom Quarks (Article) (Open Access)

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Abstract

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The observation of the standard model (SM) Higgs boson decay to a pair of bottom quarks is presented. The main contribution to this result is from processes in which Higgs bosons are produced in association with a W or Z boson (VH), and are searched for in final states including 0, 1, or 2 charged leptons and two identified bottom quark jets. The results from the measurement of these processes in a data sample recorded by the CMS experiment in 2017, comprising 41.3 fb-1 of proton-proton collisions at s=13 TeV, are described. When combined with previous VH measurements using data collected at s=7, 8, and 13 TeV, an excess of events is observed at mH=125 GeV with a significance of 4.8 standard deviations, where the expectation for the SM Higgs boson is 4.9. The corresponding measured signal strength is 1.01±0.22. The combination of this result with searches by the CMS experiment for H→bb in other production processes yields an observed (expected) significance of 5.6 (5.5) standard deviations and a signal strength of 1.04±0.20. © 2018 CERN.

SciVal Topic Prominence

Topic: jets | production | parton shower

Prominence percentile: 99.875

Indexed keywords

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References (87)

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1 Aad, G., Abajyan, T., Abbott, B., Abdallah, J., Abdel Khalek, S., Abdelalim, A.A., Abdinov, O., (...), Zwalinski, L.

Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC (Open Access)

(2012) *Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics*, 716 (1), pp. 1-29. Cited 4793 times.
http://www.sciencedirect.com/science/journal/03702693
doi: 10.1016/j.physletb.2012.08.020

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2 Chatrchyan, S., Khachatryan, V., Sirunyan, A.M., Tumasyan, A., Adam, W., Aguilo, E., Bergauer, T., (...), Wenman, D.

Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC (Open Access)

(2012) *Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics*, 716 (1), pp. 30-61. Cited 4866 times.
http://www.sciencedirect.com/science/journal/03702693
doi: 10.1016/j.physletb.2012.08.021

View at Publisher

3 Chatrchyan, S., Khachatryan, V., Sirunyan, A.M., Tumasyan, A., Adam, W., Bergauer, T., Dragicevic, M., (...), Swanson, J.

Observation of a new boson with mass near 125 GeV in pp collisions at √=7 and 8 TeV (Open Access)

(2013) *Journal of High Energy Physics*, 2013 (6), art. no. 081. Cited 287 times.
doi: 10.1007/JHEP06(2013)081

View at Publisher

4 Englert, F., Brout, R.

Broken symmetry and the mass of gauge vector mesons (Open Access)

(1964) *Physical Review Letters*, 13 (9), pp. 321-323. Cited 2079 times.
doi: 10.1103/PhysRevLett.13.321

View at Publisher

5 Higgs, P.W.

Broken symmetries, massless particlees and gauge fields

(1964) *Physics Letters*, 12 (2), pp. 132-133. Cited 2000 times.
doi: 10.1016/0031-9163(64)91136-9

View at Publisher

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