

Observation of the $\Sigma^+ \rightarrow p \mu^+ \mu^-$ rare decay

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The $\Sigma^+ \rightarrow p \mu^+ \mu^-$ decay is observed for the first time at the LHCb experiment.

This is a flavour changing neutral current sensitive to physics beyond the Standard Model, which could modify its properties.

In particular the HyperCP experiment years ago presented an evidence of this decay with a hint of a possible unknown intermediate particle.

This was excluded by LHCb already in 2018. This new measurement presents a highly significant observation and a measurement of its integrated and differential branching fraction. This is the rarest baryon decay ever observed.

Additionally, the sensitivity of these observables to Chiral Perturbation Theory parameters will be discussed.

Finally prospects for additional observables, such as a CP violation measurement, will also be presented.

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