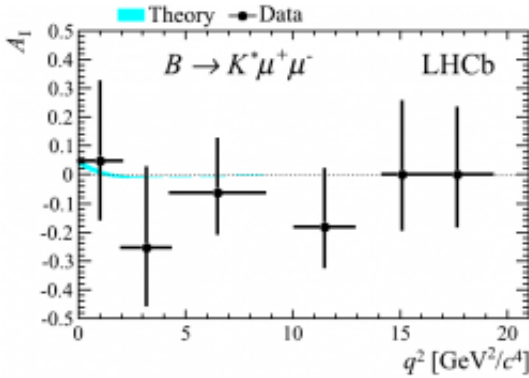


Puzzling asymmetries in B decays hint at deviations from the Standard Model

28 May 2012, by Antonella Del Rosso



(Phys.org) -- In a recently published paper, the LHCb Collaboration has reported on a possible deviation from the Standard Model. Theorists are now working to calculate precisely this effect and to evaluate the implications that such unexpected result could have on the established theory.

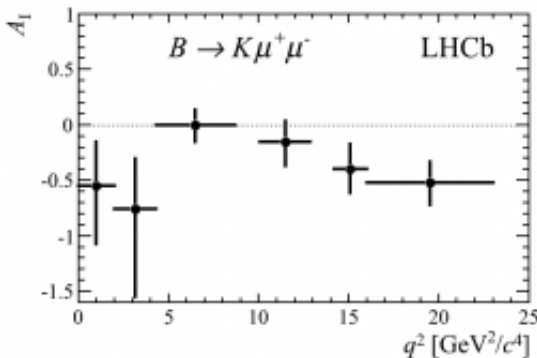
The [Standard Model](#) is able to predict the [decay rates](#) of [particles](#) with high precision. In most cases, experimentalists confirm the value predicted by [theory](#) and the figure is added to the official publications. However, this time, things seem to have taken a different route.

Studying data collected in 2011, the LHCb Collaboration found that in a specific decay – a B particle transforming into a K particle plus two charged muons (B -> K⁰?⁺?⁺) – the branching ratio of the neutral B in the corresponding decay (i.e. B⁰ -> K⁰?⁺?⁺) is different from that of the positively charged B (i.e. B⁺ -> K⁺?⁺?⁺). Such an “isospin asymmetry” between the decays of differently charged B particles was not expected, as theory predicts the corresponding value to be very close to zero. “There had been hints of such an effect from previous experiments (CDF, Belle and BaBar), which agree with the new higher-precision result from LHCb,” explains Pierluigi Campana, LHCb Spokesperson. “This result has been made possible by the strong and continuous support from the LHC operations team for the LHCb physics program.”

Theorists are now busy in calculating the exact figure that we should expect for this specific asymmetry. If theory confirms the deviation, this new experimental result could open the way to further investigations of possible new physics in B decays.

Read more details on the LHCb [website](#) and the LHCb [scientific paper](#).

Provided by CERN



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