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Implications from $B \to K^* \ell^+ \ell^-$ observables using 3fb^{-1} of LHCb data (15' + 5')

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The decay mode $B \to K^* \ell^+ \ell^-$ results in the measurement of a large number of related observables by studying the angular distribution of the decay products and is regarded as a sensitive probe of physics beyond the standard model. Recently, LHC*b* has measured several of these observables using 3fb^{-1} data, as a binned function of q^2, the dilepton invariant mass squared. We show how data can be used without any approximations to extract theoretical parameters describing the decay and to obtain a relation amongst observables within the standard model. We find three kinds of significant disagreement between theoretical expectations and values obtained by fits. The values of the form factors obtained from experimental data show significant discrepancies when compared with theoretical expectations in several q^2 bins. We emphasize that this discrepancy cannot arise due to resonances and non-factorizable contributions from charm loops. Further, a relation between form factors expected to hold at large q^2 is very significantly violated. Finally, the relation between observables also indicates some deviations in the forward-backward asymmetry in the same q^2 regions.
These discrepancies are possible evidence of physics beyond the standard model.

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