Contribution ID: **10** Type: **not specified**

B_s -> phi rhoˆ0 and B_s -> phi piˆ0 as a handle on isospin-violating New Physics

Wednesday 1 June 2011 15:30 (15 minutes)

The 2.5 sigma discrepancy between theory and experiment observed in the difference A_CP(Bˆ- –> piˆ0 Kˆ-)-A_CP(Bbarˆ0 –> piˆ+ Kˆ-) can be explained by a new electroweak penguin amplitude. We demonstrate that in presence of a such a new electroweak penguin amplitude the branching ratios of the purely isospin-violating decays B_s –> phi rhoˆ0 and B_s –> phi piˆ0 can be enhanced by up to an order of magnitude, without violating any constraints from other hadronic B decays. This makes them very interesting modes for LHCb and future B factories. We discuss both a model-independent analysis and a study within realistic New Physics models such as a modified-Zˆ0-penguin scenario, a model with an additional Z' boson and the Minimal Supersymmetric Standard Model (MSSM).

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Session Classification: P7 - FLAVOUR AND MFV