



Contribution ID: 54

Type: **not specified**

Measurement of ϕ_s

Monday 7 May 2012 14:45 (15 minutes)

Abstract:

The determination of the CP-violating phase ϕ_s in $B^0_s \rightarrow J/\psi \phi$ decays is one of the key goals of the LHCb experiment. Its value is predicted to be very small in the Standard Model but can be significantly enhanced in many models of new physics. We present the world's best measurement of ϕ_s and the first observation of a non-zero $\Delta \Gamma_s$ based upon $\sim 1 \text{ fb}^{-1}$ of data collected at LHCb during 2011. ϕ_s can also be measured using the predominantly CP-odd $B^0_s \rightarrow J/\psi \pi^+ \pi^-$ decay mode. We present this measurement and the combination of ϕ_s from both $J/\psi \phi$ and $J/\psi \pi^+ \pi^-$ decay modes. Additionally we present first results on other B_s decay modes, potentially interesting for complementary measurements of ϕ_s such as $B_s \rightarrow \phi \phi$ and $B_s \rightarrow J/\psi K^0$ decays.

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Session Classification: Flavor I