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Measurement of the fragmentation fraction ratio f_s/f_u

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Knowledge of the fragmentation fractions of B_s^0 (f_s) hadron is essential for determining absolute branching fractions (β) of decays of these hadrons in various (rare) processes at the LHC. One example is the rare disintegration $B_s^0 \rightarrow u^+ u^-$, this fragmentation process can not be reliably predicted because it is driven by strong dynamics in the non-perturbative regime. Thus fragmentation functions for the various hadron species must be determined experimentally. The precise knowledge of the fragmentation fractions, in the kinematic phase space accessed by the experiment, is an important ingredient in the measurement of B-hadron properties. The work is developed within the context of the $B_s^0 \rightarrow u^+ u^-$ analysis, where the ratio f_s/f_u enters as a key function in the branching fraction measurement because of its ability to quantify the relative production rate of the B_s^0 with respect to B^+ . So f_s/f_u is crucial to achieve greater sensitivity in the search for physics beyond the standard model. The branching fractions of a large number of B^0 and B^+ decays have been measured with high precision in the factories of B (Bell, BABAR), but no branching fraction of B_s^0 with an accuracy high enough to be used as a normalization channel is known. In the poster we will show a few preliminary results essential for the calculation of f_s/f_u at CMS experiment.

Author: Mr HERNANDEZ CASTRILLON , Diego Alexander (Universidad de Antioquia)

Co-author: MEJIA GUISAO, Jhovanny Andres (Universidad de Antioquia (CO))

Presenter: Mr HERNANDEZ CASTRILLON , Diego Alexander (Universidad de Antioquia)

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