Connecting The Dots 2022



Contribution ID: 34

Type: Plenary

One person's trash is another person's treasure: expanding physics reach with unused tracks

Wednesday, 1 June 2022 11:30 (15 minutes)

The physics reach of the LHCb detector can be extended by reconstructing particles with a long lifetime that decay downstream of the dipole magnet, using only hits in the furthest tracker from the interaction point. This allows for electromagnetic dipole moment measurements, and increases the reach of beyond the Standard Model long-lived particle searches. However, using tracks to reconstruct particles decaying in this region is challenging, particularly due to the increased combinatorics and reduced momentum and vertex resolutions, which is why it has not been done until now. New approaches have been developed to meet the challenges and obtain worthwhile physics from these previously unused tracks. This talk presents the feasibility demonstration studies performed using Run-2 data, as well as new developments that expand these techniques for further gains in Run-3.

Consider for young scientist forum (Student or postdoc speaker)

Yes

Primary authors: DE GENNARO, Alessandro (Università degli Studi e INFN Milano (IT)); MARTINEZ VIDAL, Fernando (IFIC - University of Valencia and CSIC (ES)); SANDERSWOOD, Izaac (Univ. of Valencia and CSIC (ES)); MERLI, Andrea (Università degli Studi e INFN Milano (IT)); SPADARO NORELLA, Elisabetta (Università degli Studi e INFN Milano (IT)); TONANI, Giorgia (Università degli Studi e INFN Milano (IT)); FU, Jinlin (University of Chinese Academy of Sciences (CN)); RUIZ VIDAL, Joan (Univ. of Valencia and CSIC (ES)); HENRY, Louis (CERN); GARCIA MARTIN, Luis Miguel (University of Warwick (GB)); NERI, Nicola (Università degli Studi e INFN Milano (IT)); AIOLA, Salvatore (Università degli Studi e INFN Milano (IT)); HOU, Ying-Rui (Centre National de la Recherche Scientifique (FR)); WANG, Ziyi (University of Chinese Academy of Sciences, Beijing)

Presenter: SANDERSWOOD, Izaac (Univ. of Valencia and CSIC (ES))

Session Classification: YSF Plenary