



Contribution ID: 1356

Type: **Parallel Talk**

## Reconstruction and physics opportunities of long-lived particles decaying downstream of the LHCb magnet

*Friday, 8 July 2022 17:00 (20 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.

### In-person participation

Yes

**Primary authors:** DE GENNARO, Alessandro (Istituto Nazionale di Fisica Nucleare); MARTINEZ-VIDAL, Fernando (IFIC (Universidad de Valencia-CSIC)); MERLI, Andrea (Istituto Nazionale di Fisica Nucleare); SPADARO NORELLA, Elisabetta (Istituto Nazionale di Fisica Nucleare); TONANI, Giorgia (Istituto Nazionale di Fisica Nucleare); SANDERSWOOD, Izaak (Institut de Física Corpuscular (Universitat de València)); FU, Jinlin (UCAS); RUIZ VIDAL, Joan (IFIC-Valencia); HENRY, Louis (Università di Milano, IFIC); NERI, Nicola (University and INFN Milano); HOU, Ying-Rui (University of Chinese Academy of Sciences); WANG, Ziyi (UCAS)

**Presenter:** RUIZ VIDAL, Joan (IFIC-Valencia)

**Session Classification:** Operation, Performance and Upgrade (Incl. HL-LHC) of Present Detectors

**Track Classification:** Operation, Performance and Upgrade (Incl. HL-LHC) of Present Detectors