

Rare charm decays into missing energy

Rare charm decays in and beyond the standard model

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- theory-master projects at TU Dortmund in my group
- supervision by the professor (me)
- assistance by experienced PhD student Dominik Suelmann, coauthor of "Effective field theory analysis of rare $|\Delta c| = |\Delta u| = 1$ charm decays", 2410.00115, in JHEP
- link and synergies with experimental groups interested in charm on LHCb, Dominik Mitzel (TUDO) and Angelo Carbone (UniBo)
- you will get a desk/desk top in our master office, access to computing, printing, exciting seminars and social activities

connects to recent/ongoing research in the group: improving SM description for charm FCNCs and modelling BSM signatures

you will learn how to compute branching ratios and distributions in rare charm decays in SM and beyond, using various methods

1) $\Lambda_c \rightarrow p\mu^+\mu^-$ (LHCb) and $\Lambda_c \rightarrow p\nu\bar{\nu}$ (not seen) and $SU(2)_L$ -correlations in SMEFT $L = (\nu, \ell_L)$, and leptoquarks [2010.02225](#)

2) Helicity formalism for $D \rightarrow V_1V_2$, and $V_1 \rightarrow \pi\pi$, $V_2 \rightarrow \mu\mu$. Decay observed by LHCb, improving SM description (resonances) for better SM-BSM separation [1312.1923](#), [2410.00115](#)

as in this type of fundamental research project will evolve with recent developments