

Ménil Reboud

[2013-2016] ÉNS de Lyon



[2016-2020] Ph.D. in Annecy with Diego Guadagnoli and Jean-Francois Marchand



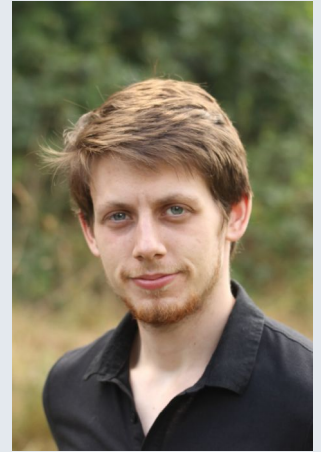
[2020-2023] Postdoc #1 at TU Munich and IPPP Durham/IJClab



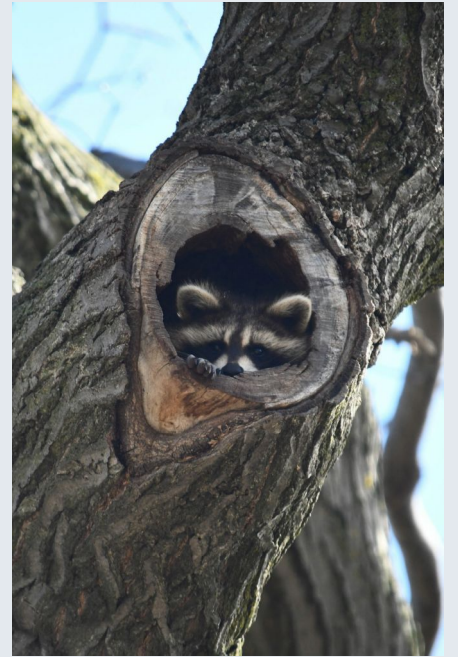
[2023-2024] Postdoc #2 in Siegen



Since 2024 Flavour group



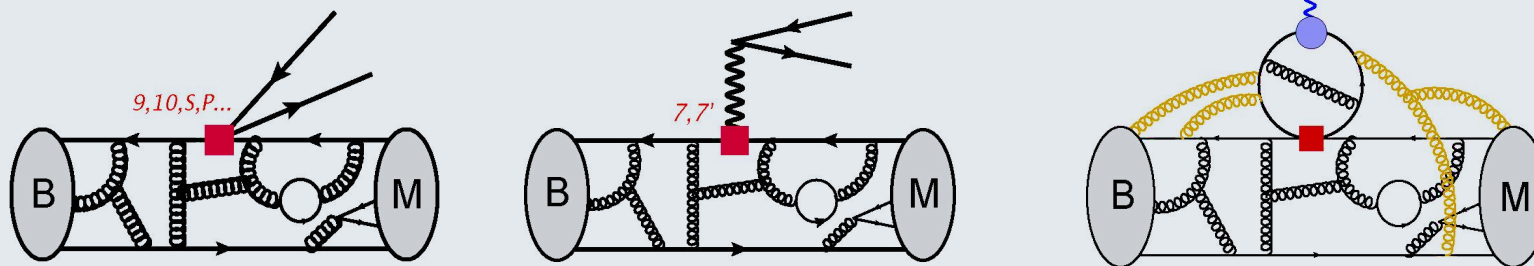
Hobbies



B physics phenomenology

- Improve **theory prediction of B-physics observables in and beyond the SM**

$$\mathcal{H}(b \rightarrow sll) = -\frac{4G_F}{\sqrt{2}} V_{tb} V_{ts}^* \sum_{i=1}^{10} C_i(\mu) \mathcal{O}_i(\mu)$$



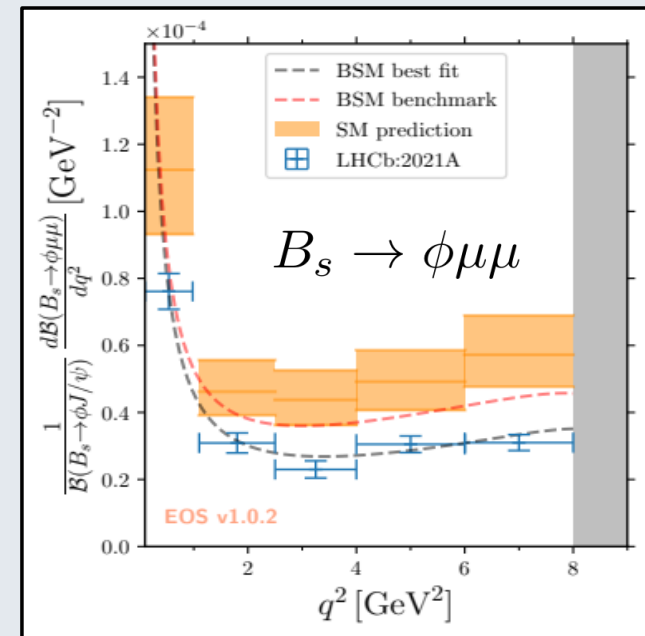
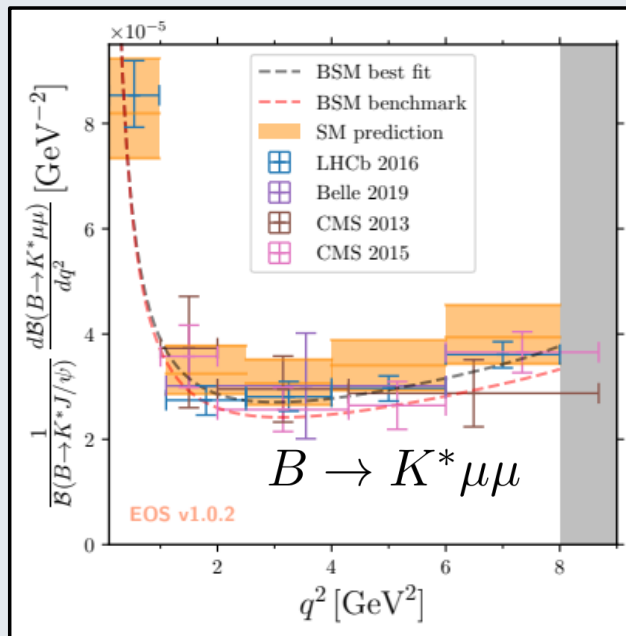
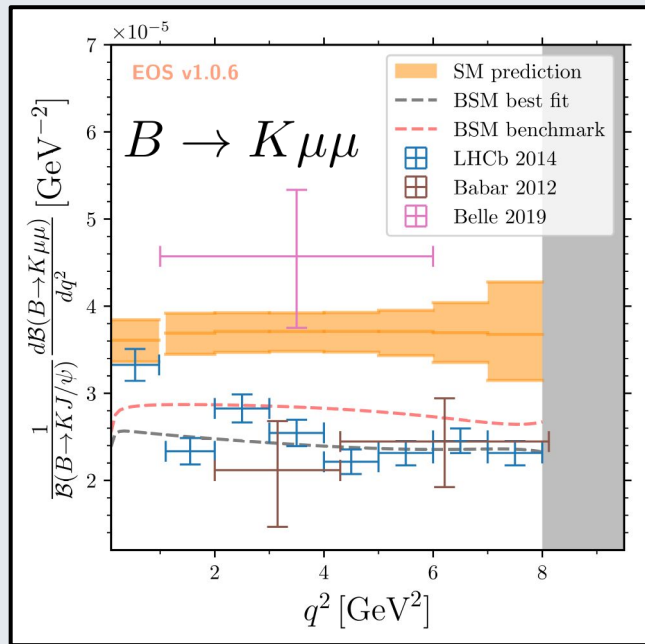
- Lattice
- QCD sum rules
- analyticity
- unitarity



Uncertainties??

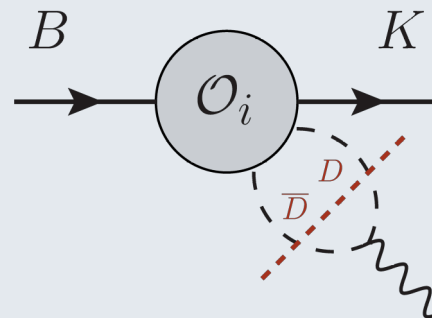
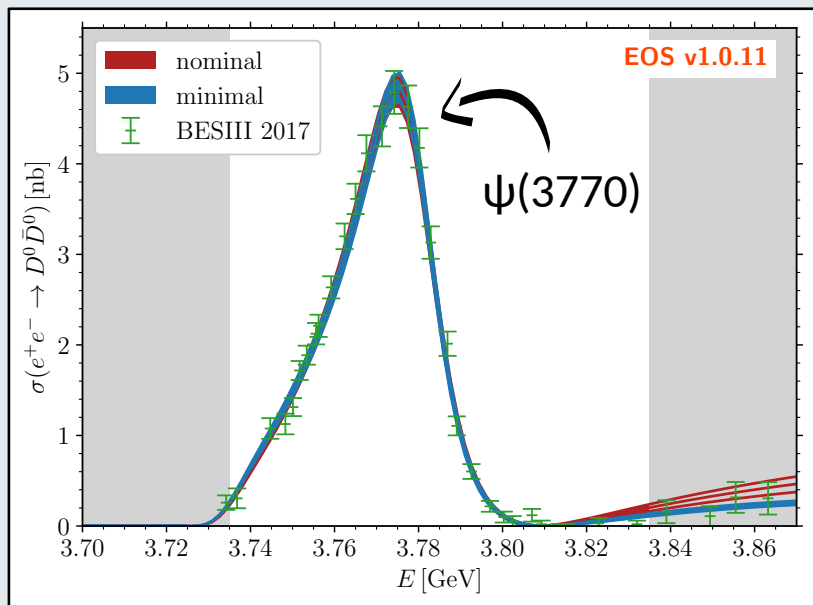
B physics phenomenology

- Improve theory prediction of B-physics observables in and beyond the SM



B physics phenomenology

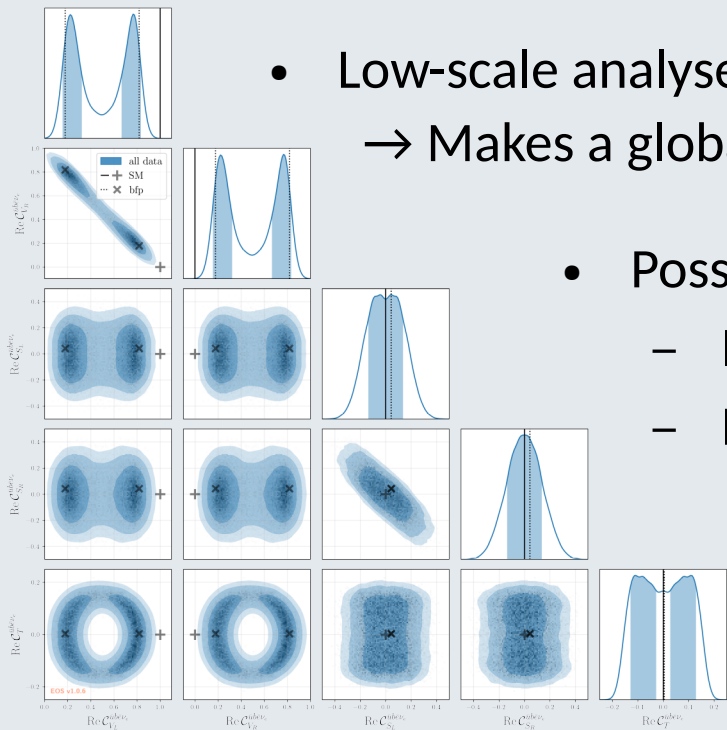
- Improve **theory prediction of B-physics observables in and beyond the SM**
- **Extract SM parameters** from combined fit of theoretical + experimental results



- Extract mass and couplings of the $c\bar{c}$ resonances in $e^+e^- \rightarrow D^{(*)}D^{(*)}$ data using a K-Matrix approach
- Predict the $c\bar{c}$ component of $B \rightarrow K\ell\bar{\ell}$

B physics phenomenology

- Improve **theory prediction of B-physics observables in and beyond the SM**
- **Extract BSM parameters** from combined fit of theoretical + experimental results



- Low-scale analyses deal with **$O(100)$ independent nuisance parameters**
→ Makes a global test of new models *impossible in practice*
- Possible path forward:
 - Perform the fit **only once** within an EFT
 - Publish the **likelihood** of the Wilson coefficients

The EOS Software

Theory inputs:

- Calculations
- Models

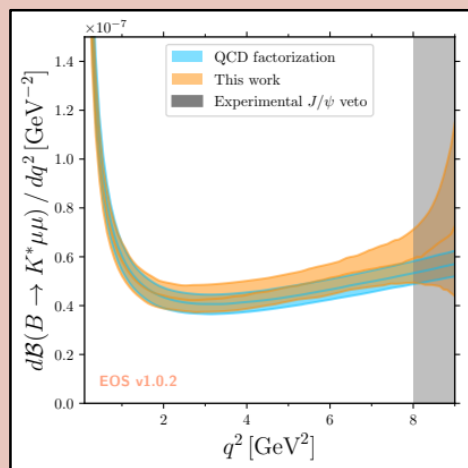
Experimental likelihoods:

- $b \rightarrow s, b \rightarrow c$
- charm physics...

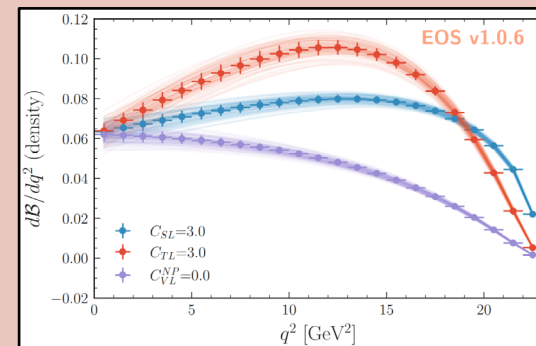


C++ & Python

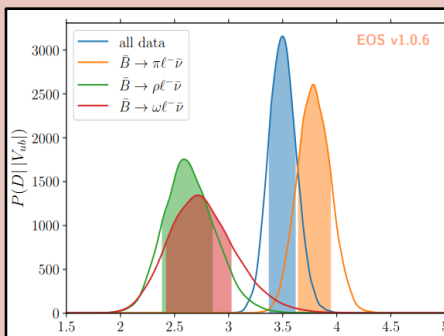
Theory predictions:



Monte-Carlo simulations:



Parameter inference:



$$|V_{ub}| = (3.50^{+0.13}_{-0.12}) \times 10^{-3}$$

<https://eos.github.io/>