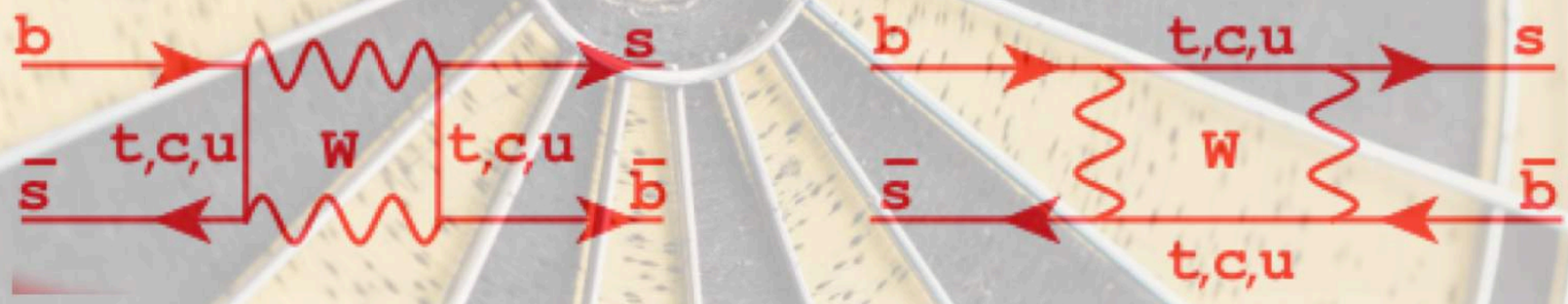
#UltimateFlavour

Towards the Ultimate Precision in Flavour Physics

@IPPP_Durham

#TUPIFP

2.- 4.4.2019 @Durham University



- Precision measurements of tree-level observables
- B decays to rare leptonic and semileptonic final states R_K
- CP violation in the charm sector ΔA_{CP}

Organising Committee

- Simone Bifani (Birmingham)
- Tim Gershon (Warwick)
- Alexander Lenz (Durham)
- Sneha Malde (Oxford)
- Mark Williams (Manchester)

2018-2019 Senior Experimental Fellows

These are awarded to small teams led by senior UK experimentalists and involving more junior researchers (postdocs and students) to support participation of UK experimentalists in the IPPP Phenomenology Network. The Fellowships are for one calendar year with a possibility of extension for another year. Starting date 1 January 2019.

The Senior Experimental Fellowships are funded by IPPP, and are intended to cover travel and local expenses to support visits of the team to Durham. The goal of the Fellowships is to support IPPP engagement with UK experimentalists, to stimulate their participation in the IPPP UK phenomenology network by strengthening research links, and to create new initiatives between the experimental and theoretical communities in the UK.

Applications for Senior Experimental Fellowships are invited from leaders of the teams and should contain a brief description of proposed activities, a programme of visits to Durham by team members, and proposals for engagement with the IPPP UK phenomenology network activities. These activities can include (but are not limited to) involvement in Topical IPPP Annual Research Programmes. Applicants are invited to send a two page proposal electronically to IPPP Director (keith.ellis@durham.ac.uk) with a copy to the IPPP Secretary Linda Grieve (linda.grieve@durham.ac.uk)

TUPiFP I
April 2018
Warwick

11:00	**Key measurements for future flavour physics experiments** *IPPP, Durham*	*Yuval Grossman* 11:00 - 11:30
	Lessons learned from LHCb about making precise flavour measurements *IPPP, Durham*	*Niels Tuning* 11:35 - 12:05
12:00	**Prospects for precision lattice QCD calculations** *IPPP, Durham*	*Andreas Kronfeld* 12:10 - 12:40
	Lunch *IPPP, Durham*	12:45 - 14:00
13:00		
14:00	**LHCb upgrade II challenges** *IPPP, Durham*	*Vladimir Gligorov* 14:00 - 14:30
	Belle II status and plans *IPPP, Durham*	*Phillip Urquijo* 14:35 - 15:05
15:00	**Coffee** *IPPP, Durham*	15:10 - 15:30
	Prospects for D decays on the lattice *IPPP, Durham*	*Maxwell Hansen* 15:30 - 15:50
16:00	**Charm hadron lifetimes in the HQE approach** *IPPP, Durham*	*Hai-Yang Cheng* 15:55 - 16:15
	Rare charm decays and asymmetries *IPPP, Durham*	*Andrea Contu* 16:20 - 16:40

Excursion: 17:00 Bus; 18:00 Hadrians Wall 19:00 Dinner

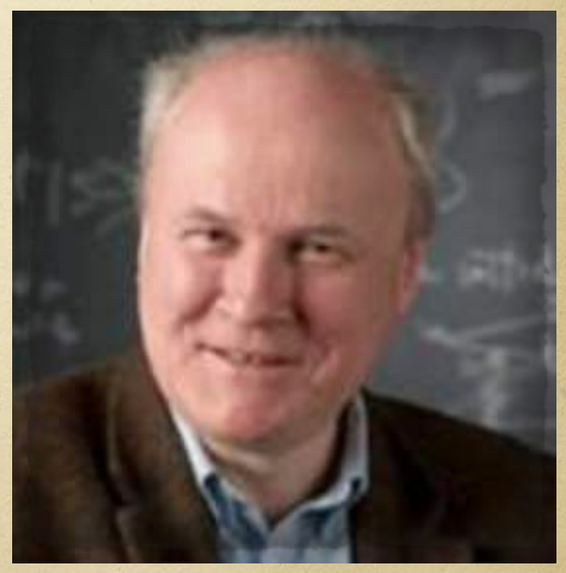
22:30 Travel back

Hadrian's Wall 122AD

Built to keep the uncivilised Picts out of the Roman Empire

Hadrian's Wall 122AD

Built to keep the uncivilised Picts out of the Roman Empire

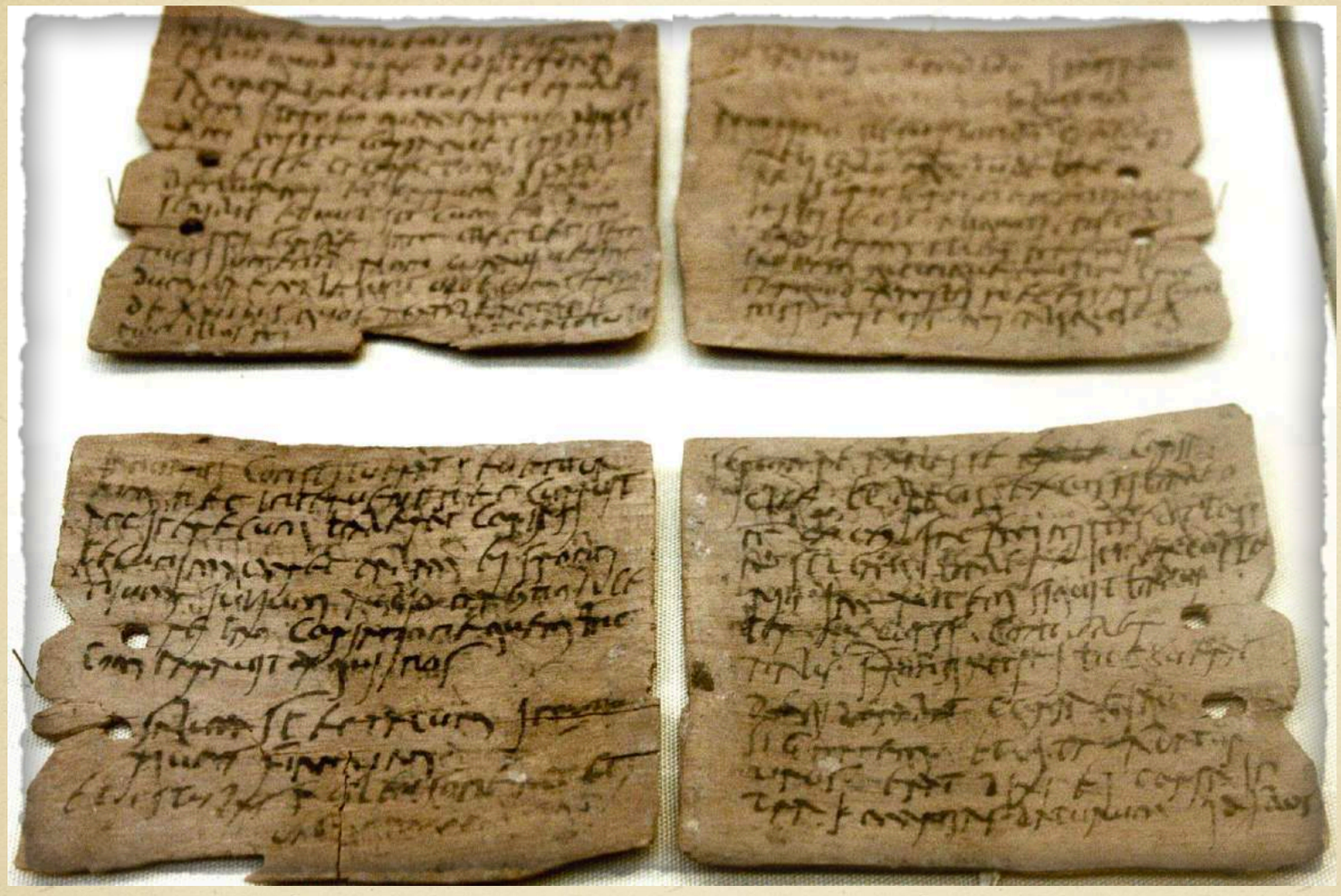


Modern descendant of the Picts

Twicebrewed Vindolanda

Treat Yourself

Vindolanda tablets



The best-known document is perhaps Tablet 291, written around AD 100 by Claudia Severa,[12] the wife of the commander of a nearby fort, to Sulpicia Lepidina, inviting her to a birthday party. The invitation is one of the earliest known examples of writing in Latin by a woman.[13] There are two handwriting styles in the tablet, with the majority of the

The Vindolanda tablets contain various letters of correspondence. For instance, the cavalry decurion Masculus wrote a letter to prefect Flavius Cerialis inquiring about the exact instructions for his men for the following day, including a polite request for more beer to be sent to the garrison (which had entirely consumed its previous stock of beer).[21] The documents also provide information about various roles performed by the men at the fort, such as a keeper of the bath-house,

Long fighting tradition in the North East of England

Many reasons to continue this tradition

Last Tuesday: $\Delta A_{CP} = BSM$

Tue, 26 Mar 2019 (showing first 25 of 37 entries)

[96] arXiv:1903.10490 [pdf, other]

ΔA_{CP} within the Standard Model and beyond

Mikael Chala, Alexander Lenz, Aleksey V. Rusov and Jakub Scholtz

Institute for Particle Physics Phenomenology, Durham University, DH1 3LE Durham, United Kingdom

Abstract

In light of the recent LHCb observation of CP violation in the charm sector, we review standard model (SM) predictions in the charm sector and in particular for ΔA_{CP}. We get as an upper bound in the SM $|\Delta A_{CP}^{\rm SM}| \leq 3 \times 10^{-4}$, which can be compared to the measurement of $\Delta A_{CP}^{\rm LHCb2019} = (-15.4 \pm 2.9) \times 10^{-4}$. We discuss resolving this tension within an extension of the SM that includes a flavour violating Z' that couples only to

Many reasons to continue this tradition

Last Wednesday:

$$\Delta A_{CP} = SM$$

Implications on the first observation of charm CPV at LHCb

Hsiang-nan Li[1*], Cai-Dian Lü[2†], Fu-Sheng Yu[3‡]

[1] *Institute of Physics, Academia Sinica, Taipei, Taiwan 11529, Republic of China*

[2] *Institute of High Energy Physics, Chinese Academy of Sciences, Beijing 100049, People's Republic of China*

[3] *School of Nuclear Science and Technology, Lanzhou University, Lanzhou 730000, People's Republic of China*

Abstract

Very recently, the LHCb Collaboration observed the CP violation (CPV) in the charm sector for the first time, with $\Delta A_{CP}^{\rm dir} \equiv A_{CP}(D^0 \to K^+K^-) - A_{CP}(D^0 \to \pi^+\pi^-) = (-1.54 \pm 0.29) \times 10^{-3}$. This result is consistent with our prediction of $\Delta A_{CP}^{\rm SM} = (-0.57 \sim -1.87) \times 10^{-3}$ obtained in the

The Emergence of the $\Delta U = 0$ Rule in Charm Physics

Yuval Grossman[*] and Stefan Schacht[†]

Department of Physics, LEPP, Cornell University, Ithaca, NY 14853, USA

Abstract

We discuss the implications of the recent discovery of CP violation in two-body SCS D decays by LHCb. We show that the result can be explained within the SM without the need for any large $SU(3)$ breaking effects. It further enables the determination of the imaginary part of the ratio of the

But how to provoke a gentleman like

[25] arXiv:1904.00940 [pdf, other]

B_s mixing observables and $|V_{td}/V_{ts}|$ from sum rules

Daniel King[(a)], Alexander Lenz[(a)] and Thomas Rauh[(a,b)]

(a) *IPPP, Department of Physics, University of Durham, DH1 3LE, United Kingdom*

(b) *Albert Einstein Center for Fundamental Physics, Institute for Theoretical Physics, University of Bern, Sidlerstrasse 5, CH-3012 Bern, Switzerland*

Abstract

We consider the effects of a non-vanishing strange-quark mass in the determination of the full basis of dimension six matrix elements for B_s mixing, in particular we get for the ratio of the $V-A$ Bag parameter in the B_s and B_d system: $\overline{B}^s_{Q_1}/\overline{B}^d_{Q_1} = 0.987^{+0.007}_{-0.009}$. Combining these results with the most recent lattice values for the ratio of decay constants f_{B_s}/f_{B_d} we obtain the most precise determination of the ratio $\xi = f_{B_s}\sqrt{\overline{B}^s_{Q_1}}/f_{B_d}\sqrt{\overline{B}^d_{Q_1}} = 1.2014^{+0.0065}_{-0.0072}$ in agreement with recent lattice determinations. We find $\Delta M_s = (18.5^{+1.2}_{-1.5})\text{ps}^{-1}$ and $\Delta M_d = (0.547^{+0.035}_{-0.046})\text{ps}^{-1}$ to be consistent with experiments at below one sigma. Assuming the validity of the SM, our calculation can be used to directly determine the ratio of CKM elements $|V_{td}/V_{ts}| = 0.2045^{+0.0012}_{-0.0013}$, which is compatible with the results from the CKM fitting groups, but again more precise.

Sum rules can do better than lattice!

Have a great workshop