Workshop on future muon EDM searches at Fermilab and worldwide

Welcome and Introduction

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This workshop is sponsored by

What is this workshop about?

- From Moore Foundation and APS: "*Visitor Awards promote collaboration and exchange of ideas among researchers who may not otherwise have the opportunity to work closely together.*"
  - bring together expertise of Fermilab Muon g-2, tracking detectors (Liverpool, Mu3e), muon EDM (J-PARC, PSI) and muon EDM theorists
- A *working workshop* to investigate an upgrade plan discussed at Fermilab for a muon electric dipole moment search after 2020
  - not limited to Fermilab Muon g-2 community, new collaborators welcome!
- A mini-workshop on muon EDM searches worldwide
  - status update from J-PARC and a new initiative at PSI
  - consolidate physics case: theoretical motivations for the muon EDM search

Friday, October 12, 2018

09:00	**Introduction to this session** (15')	Kim Siang Khaw (University of Washington)
09:15	**Updates from J-PARC Muon g-2/EDM** (40')	Tsutomu Mibe (KEK)
09:55	**Combined explanations of (g–2)μ,e and implications for a large muon EDM** (40')	Andreas Crivellin (PSI)
10:35	Coffee break (20')	
10:55	**A model-independent analysis of the electron/muon EDM** (40')	Emilie Passemar Martin Jung
11:35	**Muon EDM search at PSI using frozen spin technique** (40')	Philipp Schmidt-Wellenburg (Paul Scherrer Institute)
12:15	Lunch break (1h45')	
14:00	Theoretical motivations for a large muon EDM (1h30')	
15:30	Coffee break (20')	
15:50	Possible collaborations for the future muon EDM search at FNAL and frozen spin technique muon EDM search at PSI (1h10')	

An invitation to the theory community

	AC	RVV2	AKM	δLL	FBMSSM	LHT	RS
$D^0 - \bar{D}^0$	★★★	★	★	★	★	★★★	?
ϵ_K	★	★★★	★★★	★	★	★★	★★★
$S_{\psi\phi}$	★★★	★★★	★★★	★	★	★★★	★★★
$S_{\phi K_S}$	★★★	★★	★	★★★	★★★	★	?
$A_{\rm CP}\,(B \to X_s\gamma)$	★	★	★	★★★	★★★	★	?
$A_{7,8}(B \to K^*\mu^+\mu^-)$	★	★	★	★★★	★★★	★★	?
$A_9(B \to K^*\mu^+\mu^-)$	★	★	★	★	★	★	?
$B \to K^{(*)}\nu\bar{\nu}$	★	★	★	★	★	★	★
$B_s \to \mu^+\mu^-$	★★★	★★★	★★★	★★★	★★★	★	★
$K^+ \to \pi^+\nu\bar{\nu}$	★	★	★	★	★	★★★	★★★
$K_L \to \pi^0\nu\bar{\nu}$	★	★	★	★	★	★★★	★★★
$\mu \to e\gamma$	★★★	★★★	★★★	★★★	★★★	★★★	★★★
$\tau \to \mu\gamma$	★★★	★★★	★	★★★	★★★	★★★	★★★
$\mu + N \to e + N$	★★★	★★★	★★★	★★★	★★★	★★★	★★★
d_n	★★★	★★★	★★★	★★	★★★	★	★★★
d_e	★★★	★★★	★★	★	★★★	★	★★★
$(g-2)_\mu$	★★★	★★★	★★	★★★	★★★	★	?

Table 8: "DNA" of flavour physics effects for the most interesting observables in a selection of SUSY and non-SUSY models ★★★ signals large effects, ★★ visible but small effects and ★ implies that the given model does not predict sizable effects in that observable.

arXiv:0909.1333 [hep-ph]