

# H4I EFT analysis: New categorisation for Moriond 2017

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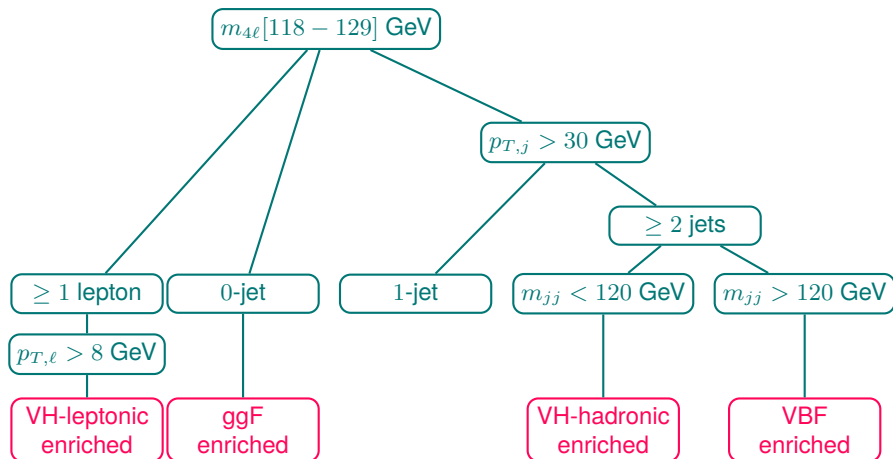
08.11.2016

MPP Higgs Meeting



Max-Planck-Institut für Physik  
(Werner-Heisenberg-Institut)

## Recap: EFT-analysis, categorization ICHEP 2016



# New categorization SM analysis Moriond 2017 - is it also suited for EFT analysis?

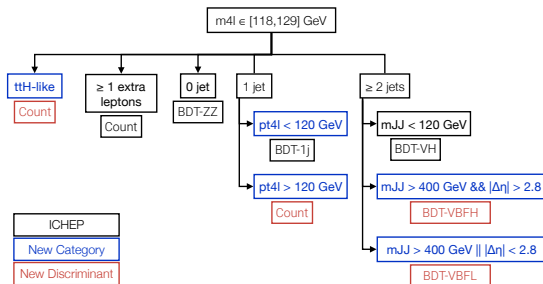
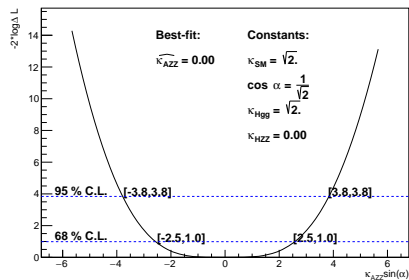


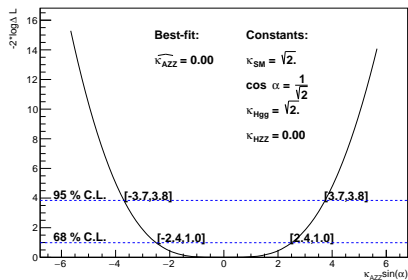
Figure: Courtesy of Haider Abidi

# Comparison $\kappa_{AZZ}^* \text{sina}$ fit

## ICHEP categorisation

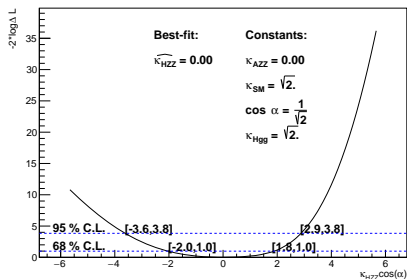


## Moriond categorisation

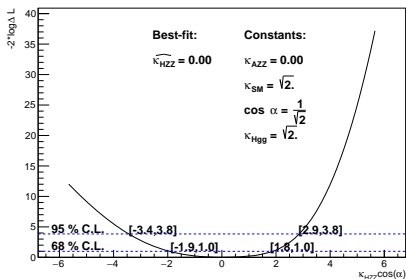


# Comparison kHzz\*cosa fit

## ICHEP categorisation

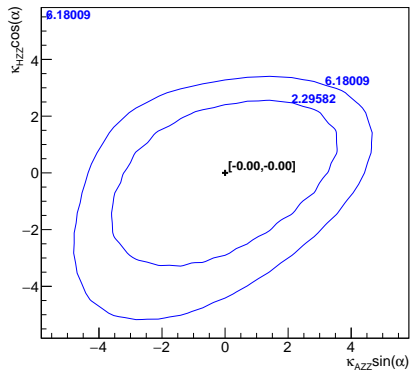


## Moriond categorisation

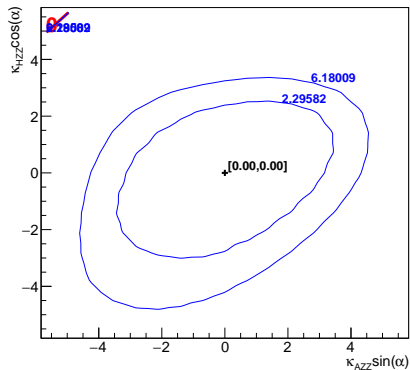


# Comparison $k_{AZZ} \cdot \sin(\alpha)$ and $k_{HZZ} \cdot \cos(\alpha)$ fit

ICHEP categorisation



Moriond categorisation



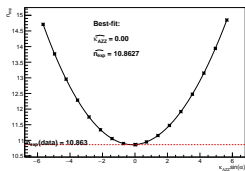
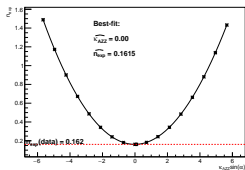
## Summary and Plans

- No large improvement from new categorisation
  - Plan: From previous studies seen that  $p_{TH}$  is very sensitive for categories with high VBF+VH component
- Split 2-jet categories in  $p_{TH}$
- Goal for Moriond: 2D-scan of  $k_{HVV} \cdot \cos\alpha$  vs  $k_{AVV} \cdot \sin\alpha$  with SM components left free in the fit
- Check if this is feasible with rates only or if we need additional discriminants
- We are adding currently all possible kinematic distributions to our model (4l-,2j-,4l2j- kinematics, also multivariate variables: BDT used for SM analysis and OOs)
- Once adding is finished and binning is checked, try to fit to BSM Asimov and see if we get any gain from adding variables (we will probably do it with 300 fb first)

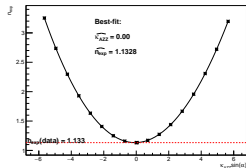
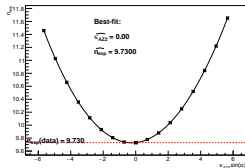
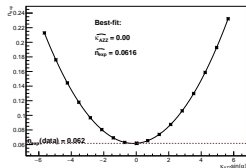
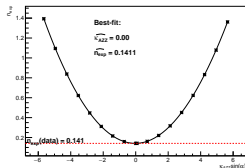
# Backup



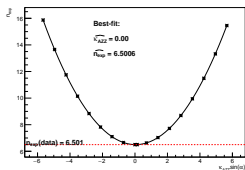
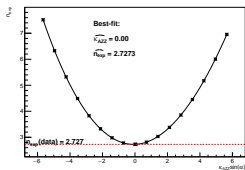
# ICHEP 2016: nexp vs kAzz addLep and 1-jet categories



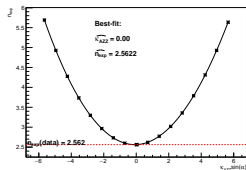
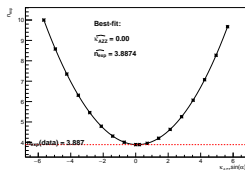
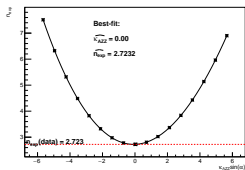
# Moriond 2017: nexp vs kAzz addLep(+ttHlike) and 1-jet categories



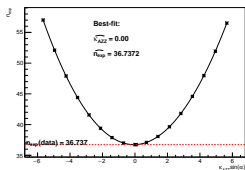
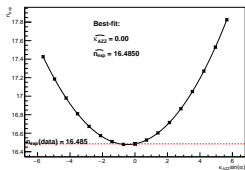
# ICHEP 2016: nexp vs kAzz 2-jet categories



# Moriond 2017: nexp vs kAzz 2-jet categories



# ICHEP 2016: nexp vs kAzz 0-jet and all categories together



# Moriond 2017: nexp vs kAzz 0-jet and all categories together

