

# Work process

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Supervisor : Mingshui Chen

CMS

2022.5-2022.8

- **Analysis**

- Search for high mass Higgs(500-3000GeV) in HZZ2L2Q final state with Full RunII Data
- Search for aTGC in Semileptonic WV and ZV channels

- **Hardware**

- CSC Doc shift



# HZZ2L2Q Analysis



## • Status

- Almost go through all the steps with **UL datasets**
- Preliminary Limit result

## • Plan

- Finish AN-note([AN-21-172](#))
- For resolved case, we will replace **DeepCSV** by **DeepJet** for b-tag
- Uncertainty study

Available on CMS information server CMS AN -2021/172



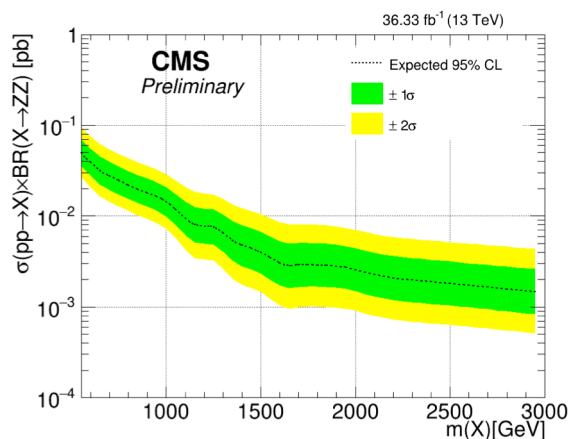
12 October 2021

Search for spin-0 diboson resonances in the dilepton + jets final state at  $\sqrt{s} = 13\text{TeV}$  with full RunII dataset

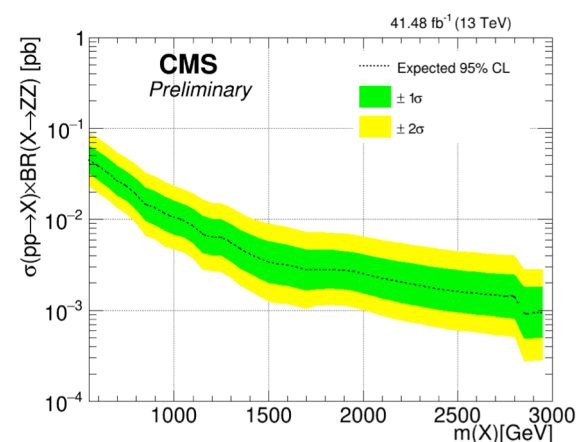
Tongguang Cheng, Mingshui Chen, Jialin Guo

### Abstract

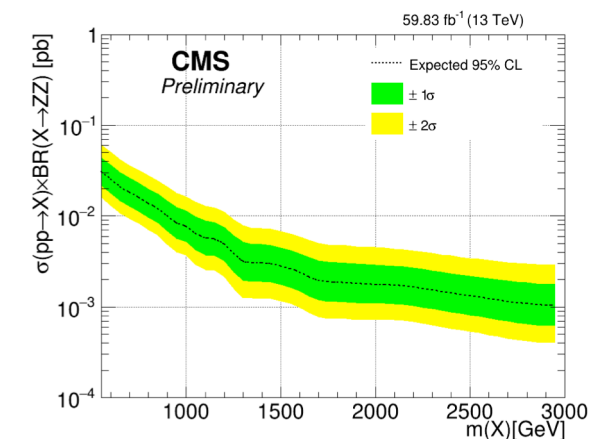
A search for a new boson decay into two Z bosons with subsequent decay into two leptons and two quark-jets, HZZ $\to$ L2Q, is performed. This Analysis uses 137 fb $^{-1}$  of data collected by the CMS experiment from proton-proton collisions produced in LHC at  $\sqrt{s} = 13\text{TeV}$  from 2016 to 2018. The analysis is a pre-study for information on a particle.



2022/9/2



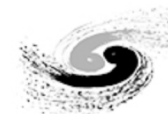
CMS SubGroup



3



# aTGC Analysis



Institute of High Energy Physics  
Chinese Academy of Sciences

## Effective field theory(EFT): the natural way to extend the standard model

- Satisfy the S-matrix axioms of unitary, symmetries of the standard model(SM)
- Recover the standard model  $\Lambda \gg m, \mathcal{L}_{eff} \rightarrow \mathcal{L}_{SM}$
- General enough to capture any physics beyond the standard model

Theoretical Description  $\mathcal{L}_{eff} = \mathcal{L}_{SM} + \sum_i \frac{c_i}{\Lambda^2} \mathcal{O}_i + \dots$   
 $= \mathcal{L}_{SM} + \frac{c_{WWW}}{\Lambda^2} \mathcal{O}_{WWW} + \frac{c_W}{\Lambda^2} \mathcal{O}_W + \frac{c_B}{\Lambda^2} \mathcal{O}_B$

Where:

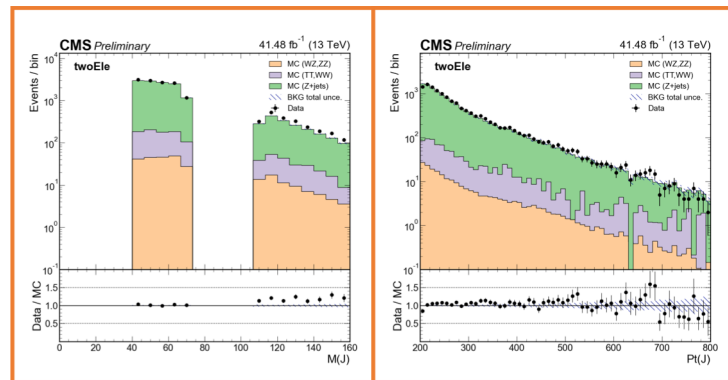
$$\mathcal{O}_{WWW} = Tr[W_{uv}W^{v\rho}W_\rho^u], \mathcal{O}_W = (D_u\phi)^\dagger W^{v\rho}(D_v\phi), \mathcal{O}_B = (D_u\phi)^\dagger B^{v\rho}(D_v\phi)$$

Lead to:

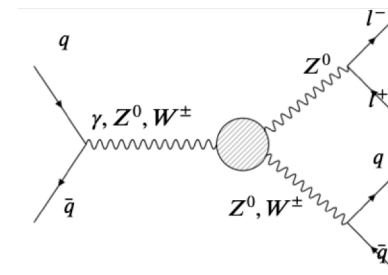
$$\frac{c_W}{\Lambda^2} = \frac{2}{M_Z^2} (\tan^2\theta_w \Delta\kappa_\gamma + \Delta\kappa_Z), \frac{c_B}{\Lambda^2} = \frac{2}{M_Z^2} (\Delta\kappa_\gamma - \Delta\kappa_Z)$$

## Status

- Framework ready for ZV final state
- Datasets produce & basic event selections
- Preliminary Data MC looks fine

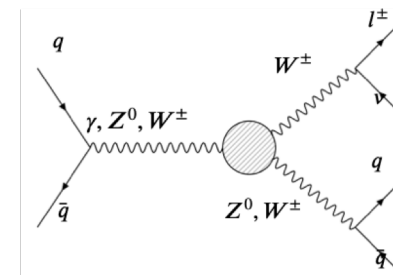


ZV Channel



IHEP  
★First analysis with ZV semi-leptonic

WV Channel



University Of Hamburg

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CMS AN -2022/091



The Compact Muon Solenoid Experiment

## Analysis Note

The content of this note is intended for CMS internal use and distribution only



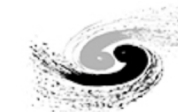
12 July 2022

## Search for aT(N)GC in Semileptonic WV and ZV channels

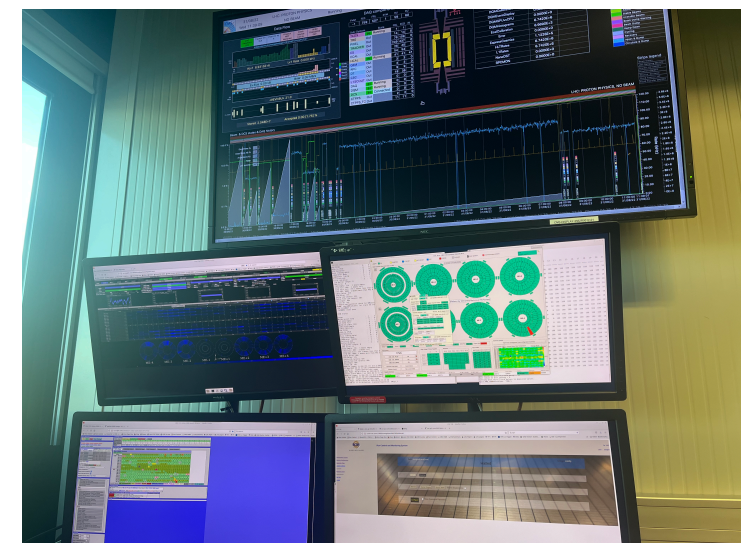
Mingshui Chen, Tongguang Cheng, Jialin Guo, Andreas Hinzmann, Ankita Mehta, Vukasin Milosevic, Ram Krishna Sharma



# CSC DOC Shift



- Monitor running state of CSC
- Daily health check for system
- Check and Report issues
- Help expert to solve problem



## Issue comes up

## Check

## Report, help solve and log

The screenshot shows a complex monitoring interface with various data points, graphs, and a prominent yellow alert banner at the top that reads 'Back to Yellow Page'. Below the alert, there are sections for 'ALCT Firmware Status', 'ALCT Test Pulse Status', and 'Voltages, Currents, and Temperatures'.

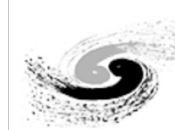
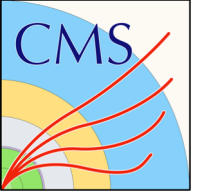
This screenshot provides a detailed view of the alert content. It includes the following sections:

- ALCT Firmware Status:** Shows firmware version information and a 'Fast Control: ME11' status.
- ALCT Test Pulse Status:** Displays test pulse parameters such as 'Test Pulse Power-Switch (0 to OR) = 1' and 'Test Pulse Group-Mask (7 bits, 6-4) = 1111111'.
- Voltages, Currents, and Temperatures:** A table showing power line measurements:
 

power line	+3.3V	+1.8V	+5.5V B	+5.5V A
measured V	12.03V	12.03V	XXXXXX	12.03 V
measured I	6.12A	6.12A	XXXXXX	6.12 A
- ALCT Mazerline:** Shows temperature readings for FPDA and OBTA.

This screenshot shows a CMS support request log entry for a configuration issue. The entry includes the following details:

- Message ID:** 1154272
- Entry time:** WED 31.AUG.22 11:01:48
- Author:** JIALIN GUO, jialin.guo@cern.ch
- Type:** Configuration
- Subject:** Configuration issue
- Description:** A detailed text description of the problem, mentioning a configuration change and the resolution process.
- Attachments:** DQMProblem.jpg, 1258326 B



# Thanks