

CEPC HZZ Project

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Current Status

- **Produced Ntuples with one criteria for all the three channels**
- **Finished merging the framework (nnhzz & mumuhzz)
(waiting for check)**
- **Dalitz Plot preliminary study**

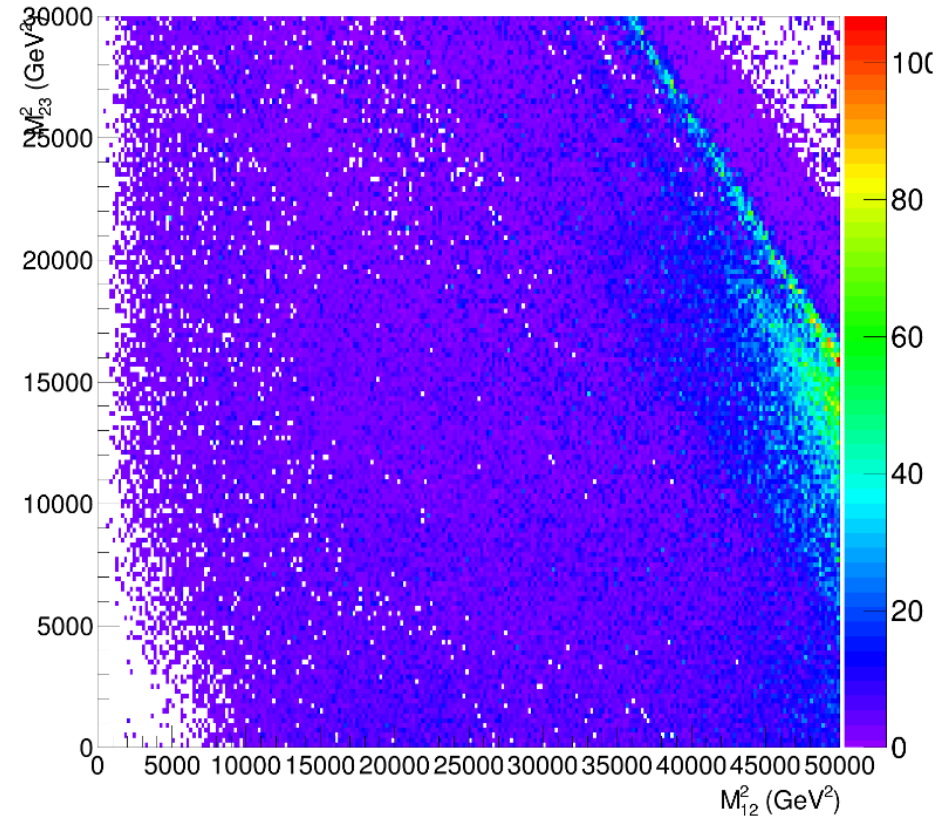
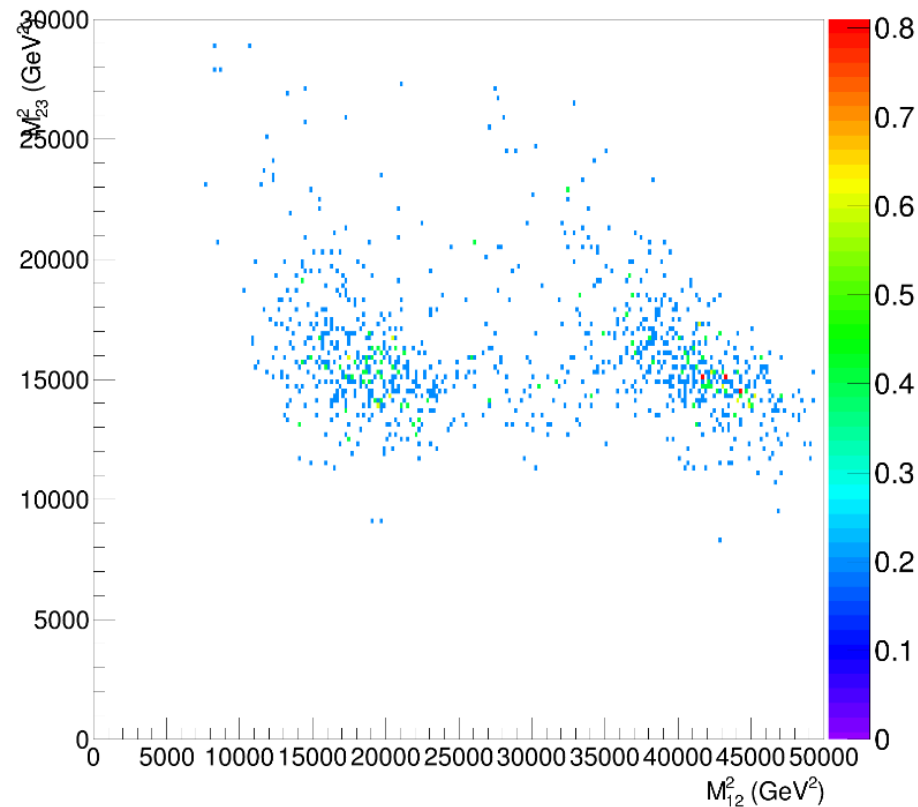
Object selection Final Version

$\frac{E(\text{cone})}{E(\text{track})}$	0.1
<i>Lepton Emin /Gev</i>	3
<i>Lepton Emax /Gev</i>	<i>none</i>
<i>Isolation Minimum Track Energy/Gev</i>	3
<i>Use PID</i>	<i>true</i>
<i>Minimum Jet Energy/Gev</i>	1
<i>Total Npfo of two jets</i>	5

- **Produced Ntuples with this criteria, usable for all the three channels**

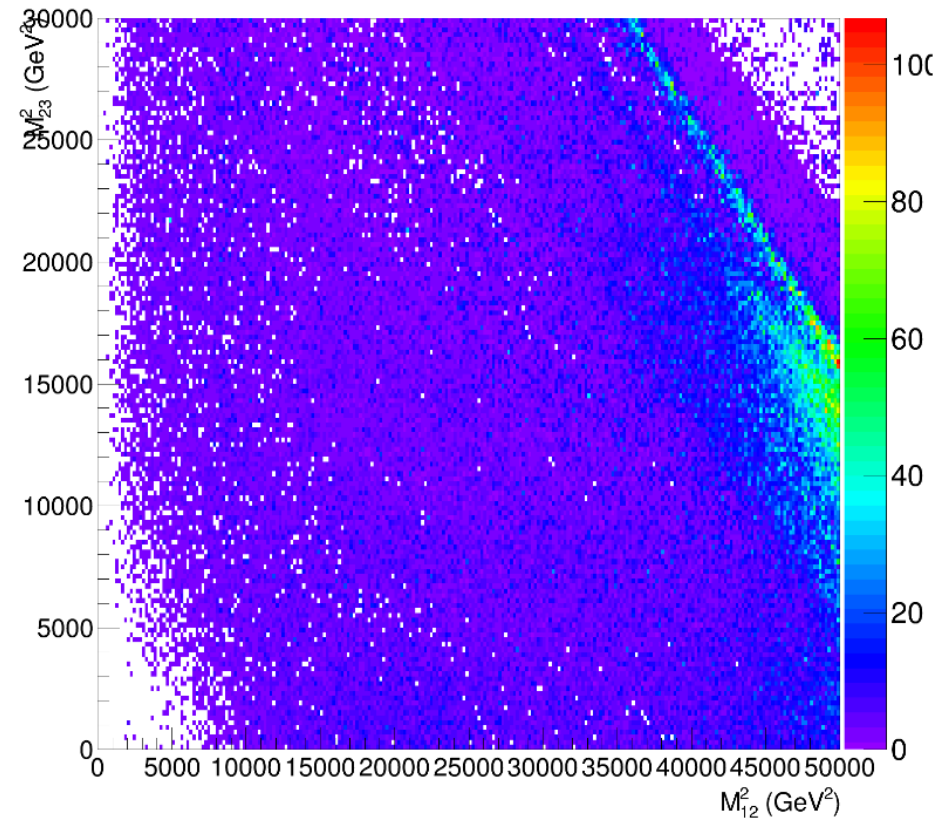
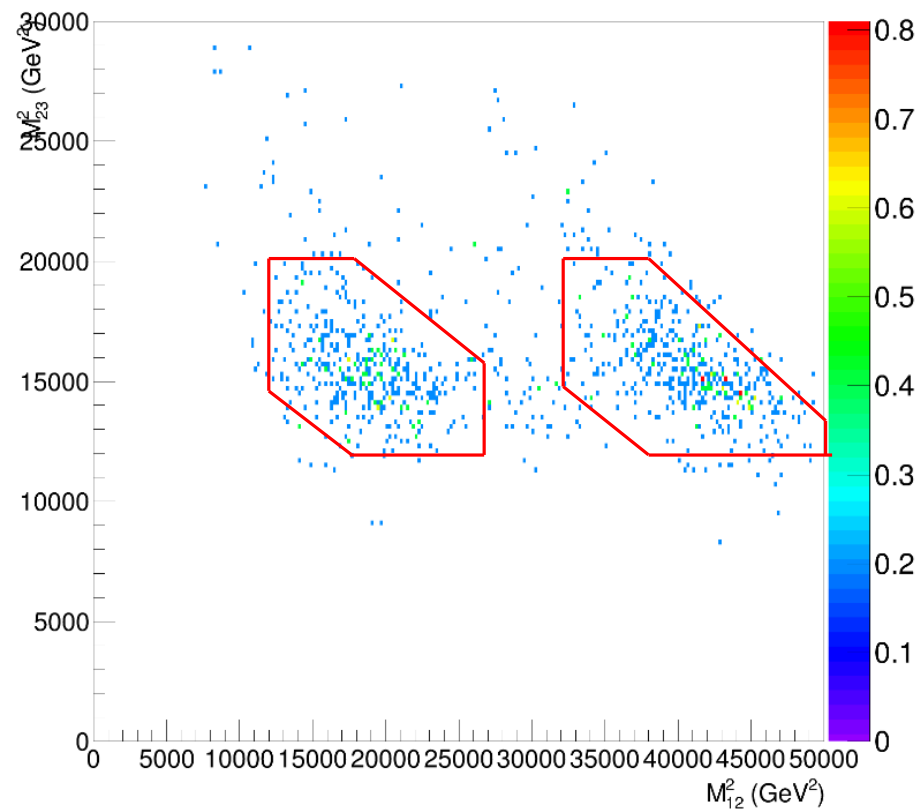
Dalitz Plot Preliminary Study (qqHZZ*)

- X axis: $M_{Di-jet + Di-muon}^2$
- Y axis: $M_{Di-muon + Missing}^2$



Dalitz Plot Preliminary Study (qqHZZ*)

➤ Apply simple 2D cut



Dalitz Plot Preliminary Study (qqHZZ*)

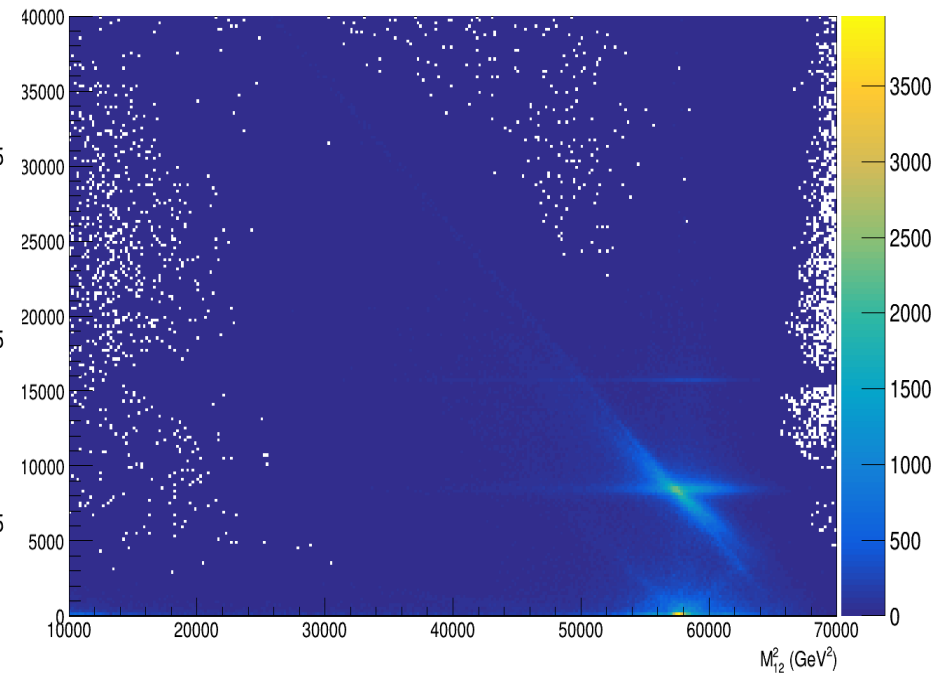
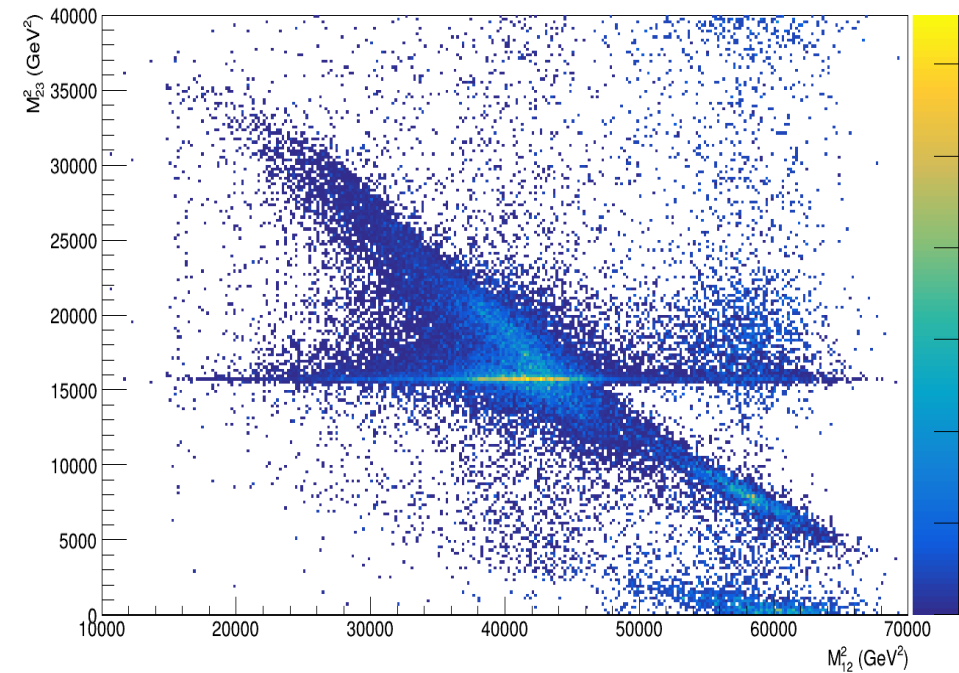
➤ Applied simple 2D cut

cut	qqhzz	zh	2f	4f
Raw events	20254	1140511	801811977	107203890
pre-selection	826	30494	480828	515425
2m+2j	203	30271	480828	515425
Npfo	180	18036	14766	298938
Vis_mass	149	4638	3836	30476
cos_theta	120	3594	0	7271
RecM(dimuon)	102	2559	0	2530
vis_all_p	96	2244	0	1897
M(dijet)	88	1587	0	1028
jet_lead_e	85	1467	0	733
jet_sub_e	84	1435	0	628
angle_mj	78	1240	0	475
M(dimuon)	74	1045	0	369
vis_all_cos	71	994	0	289
RecM(vis_all)	62	657	0	249
vis_all_pt	61	651	0	242
not mmhzz	60	418	0	227
not nnhzz	57	406	0	224
Dalitz Cut	52	259	0	120

Dalitz Plot Preliminary Study (qqHZZ*/mumuHZZ*/nnHZZ*)

Signal (combination of 3 channels)

All Backgrounds



- X axis: M_{ZZ}^2
- Y axis: $M_{ZZ^*}^2$

Merging mmHzz and vvHzz

- **Successfully merged two channels together**
- **qqHzz channels need to be merged**
- **Check with previous results needed**