

## Requirements for the $H \rightarrow ZZ \rightarrow 4\ell$ fiducial phase space

### Lepton kinematics and isolation

Leading lepton $p_T$	$p_T > 20 \text{ GeV}$
Sub-leading lepton $p_T$	$p_T > 10 \text{ GeV}$
Additional electrons (muons) $p_T$	$p_T > 7(5) \text{ GeV}$
Pseudorapidity of electrons (muons)	$ \eta  < 2.5 (2.4)$
Sum of scalar $p_T$ of all stable particles within $\Delta R < 0.3$ from lepton	$< 0.35 p_T$

### Event topology

Existence of at least two same-flavor OS lepton pairs, where leptons satisfy criteria above	
Inv. mass of the $Z_1$ candidate	$40 < m_{Z_1} < 120 \text{ GeV}$
Inv. mass of the $Z_2$ candidate	$12 < m_{Z_2} < 120 \text{ GeV}$
Distance between selected four leptons	$\Delta R(\ell_i, \ell_j) > 0.02$ for any $i \neq j$
Inv. mass of any opposite sign lepton pair	$m_{\ell+\ell'} > 4 \text{ GeV}$
Inv. mass of the selected four leptons	$105 < m_{4\ell} < 160 \text{ GeV}$