Signal	Parameter	SRs used in combination
Fermiophilic dilaton-like ϕ production and decay $t\bar{t}\phi(\rightarrow\mu\mu, \rightarrow\tau\tau)$ combination	g_{tS}^2	For ϕ masses less than 30 GeV: $t\bar{t}\phi(\mu\mu)$ SR1-2 and $t\bar{t}\phi(\tau\tau)$ SR1-3, 5-7 For ϕ masses more than or equal to 30 GeV: $t\bar{t}\phi(\tau\tau)$ all SRs
Fermiophilic axion-like ϕ production and decay $t\bar{t}\phi(\rightarrow\mu\mu, \rightarrow\tau\tau)$ combination	g_{tPS}^2	For ϕ masses less than 30 GeV: $t\bar{t}\phi(\mu\mu)$ SR1-2 and $t\bar{t}\phi(\tau\tau)$ SR1-3, 5-7 For ϕ masses more than or equal to 30 GeV: $t\bar{t}\phi(\tau\tau)$ all SRs
H-like production $X\phi(\rightarrow ee)$ combination	$\sin^2\theta\,\mathcal{B}(\phi\rightarrow ee)$	$W\phi(ee)/Z\phi(ee)$ all SRs, and $t\bar{t}\phi(ee)$ SR1-2
H-like production $X\phi(\rightarrow\mu\mu)$ combination	$\sin^2\theta\,\mathcal{B}(\phi\rightarrow\mu\mu)$	$W\phi(\mu\mu)/Z\phi(\mu\mu)$ all SRs, and $t\bar{t}\phi(\mu\mu)$ SR1-2
H-like ϕ production and decay $X\phi(\rightarrow\mu\mu, \rightarrow\tau\tau)$ combination	$\sin^2\theta$	For ϕ masses less than 30 GeV: $X\phi(\rightarrow\mu\mu)$ combination and $t\bar{t}\phi(\tau\tau)$ SR2-3 For ϕ masses more than or equal to 30 GeV: $t\bar{t}\phi(\tau\tau)$ all SRs