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# Monte Carlo samples for BSM physics studies

- The numbers of produced events were last updated on 15/12/2015 at 11:20
- All samples were generated using WHIZARD 1.95 unless explicitly stated otherwise.

## Samples to search for hidden valley models via Higgs decays at 3

Type	Energy	Detector	ProdID	Events planned	Events produced	[fb]	Comments
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	4325	200000	219800	415.0*	m(h) = 126 GeV, m(_v) = 50 GeV, lifetime(_v) = 1 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	4317	200000	219000	415.0*	m(h) = 126 GeV, m(_v) = 50 GeV, lifetime(_v) = 10 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	4328	200000	219400	415.0*	m(h) = 126 GeV, m(_v) = 50 GeV, lifetime(_v) = 100 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	4331	200000	219100	415.0*	m(h) = 126 GeV, m(_v) = 50 GeV, lifetime(_v) = 300 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	4400	20000	20000	415.0*	no overlay, m(h) = 126 GeV, m(_v) = 50 GeV, lifetime(_v) = 1 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	4403	20000	20000	415.0*	no overlay, m(h) = 126 GeV, m(_v) = 50 GeV, lifetime(_v) = 10 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	4406	20000	19900	415.0*	no overlay, m(h) = 126 GeV, m(_v) = 50 GeV, lifetime(_v) = 100 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	4409	20000	20000	415.0*	no overlay, m(h) = 126 GeV, m(_v) = 50 GeV, lifetime(_v) = 300 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	8019	200000	219500	415.0*	m(h) = 126 GeV, m(_v) = 25 GeV, lifetime(_v) = 1 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	8022	200000	219800	415.0*	m(h) = 126 GeV, m(_v) = 25 GeV, lifetime(_v) = 10 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	8025	200000	219700	415.0*	m(h) = 126 GeV, m(_v) = 25 GeV, lifetime(_v) = 100 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	8028	200000	219400	415.0*	m(h) = 126 GeV, m(_v) = 25 GeV, lifetime(_v) = 300 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	8031	200000	219900	415.0*	m(h) = 126 GeV, m(_v) = 35 GeV, lifetime(_v) = 1 ps
ee->hvv, h->_v_v, _v->bb	3 TeV	CLIC_ILD	8034	200000	219200	415.0*	m(h) = 126 GeV, m(_v) = 35 GeV, lifetime(_v) = 10 ps

_v->bb							ps
ee->hvv, h-> _v _v, _v->bb	3 TeV	CLIC_ILD	8037	200000	220000	415.0*	m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 100 ps
ee->hvv, h-> _v _v, _v->bb	3 TeV	CLIC_ILD	8040	200000	220000	415.0*	m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 300 ps

\* = assuming BR(h-> \_v \_v) = 100%, BR( \_v->bb) = 100%

## Samples to search for hidden valley models via Higgs decays at 350

Type	Energy	Detector	ProdID (generator files)	ProdID	Events planned	Events produced	[fb]	Comments
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10951	10953	200000	240000	93.44*	m(h) = 126 GeV, m( _v) = 25 GeV, lifetime( _v) = 1 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10942	10944	200000	240000	93.44*	m(h) = 126 GeV, m( _v) = 25 GeV, lifetime( _v) = 10 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10930	10932	200000	239800	93.44*	m(h) = 126 GeV, m( _v) = 25 GeV, lifetime( _v) = 100 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10960	10962	200000	239800	93.44*	m(h) = 126 GeV, m( _v) = 25 GeV, lifetime( _v) = 300 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10954	10956	200000	240000	93.44*	m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 1 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10945	10947	200000	240000	93.44*	m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 10 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10451	10453	200000	239600	93.44*	m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 100 ps

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								NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10963	10965	200000	239400	93.44*	m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 300 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10969	10971	200000	240000	93.44*	no overlay, m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 1 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10972	10974	200000	239800	93.44*	no overlay, m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 10 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10975	10977	200000	239800	93.44*	no overlay, m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 100 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10978	10980	200000	240000	93.44*	no overlay, m(h) = 126 GeV, m( _v) = 35 GeV, lifetime( _v) = 300 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10957	10959	200000	240000	93.44*	m(h) = 126 GeV, m( _v) = 50 GeV, lifetime( _v) = 1 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10948	10950	200000	240000	93.44*	m(h) = 126 GeV, m( _v) = 50 GeV, lifetime( _v) = 10 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10933	10935	200000	239400	93.44*	m(h) = 126 GeV, m( _v) = 50 GeV, lifetime( _v) = 100 ps NEW
ee->hZ, Z->qq, h-> _v _v, _v->bb	350 GeV	CLIC_ILD	10966	10968	200000	240000	93.44*	m(h) = 126 GeV, m( _v) = 50 GeV, lifetime( _v) = 300 ps



( from EPA)							172 degrees
e -> e ( from BS)	3 TeV	CLIC_SiD	6317	100000	117050	30.5	m(e ) > 1.5 TeV and 8 < (e, ) < 172 degrees
e -> e ( from EPA)	3 TeV	CLIC_SiD	6320	100000	113700	4.60	m(e ) > 1.5 TeV and 8 < (e, ) < 172 degrees
e -> e ( from BS)	3 TeV	CLIC_SiD	6323	100000	118500	30.4	m(e ) > 1.5 TeV and 8 < (e, ) < 172 degrees

## Samples to study lepton flavour violating Higgs decays

Type	Energy	Detector	ProdID	Events planned	Events produced	[fb]	Comments
ee->hvv, h->emu	1.4 TeV	CLIC_ILD	8217	10000	10000	244.0 (1)	m(h) = 126 GeV
ee->hvv, h->etau	1.4 TeV	CLIC_ILD	11145	10000	10000	244.0 (2)	m(h) = 126 GeV NEW
ee->hvv, h->mutau	1.4 TeV	CLIC_ILD	11148	10000	10000	244.0 (3)	m(h) = 126 GeV NEW
ee->llvv	1.4 TeV	CLIC_ILD	8234	1500000	1570800	978.5	l = e,μ, ; v = v_e,v_μ,v_ ; 5° < (l) < 5°; m(l,l) > 50 GeV, m(h) = 12 TeV

(1) = assuming BR(h->e-mu+) = 50%, BR(h->e+mu-) = 50%

(2) = assuming BR(h->e-tau+) = 50%, BR(h->e+tau-) = 50%

(3) = assuming BR(h->mu-tau+) = 50%, BR(h->mu+tau-) = 50%

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