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Anomalous gauge couplings of the Higgs boson at high energy photon colliders

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We study the sensitivity of testing the anomalous gauge couplings (g_HVV) of the Higgs boson in the formulation of linearly realized gauge symmetry via the processes gamma gamma to ZZ and gamma gamma to WWWW at polarized and unpolarized photon colliders based on e+e- linear colliders of c.m.energies 500 GeV, 1 TeV, and 3 TeV. Signals beyond the standard model (SM) and SM backgrounds are carefully studied. We propose certain kinematic cuts to suppress the standard model backgrounds. For an integrated luminosity of 1 ab-1, we show that (a) gamma gamma to ZZ can provide a test of g_Hgammagamma to the 3 sigma sensitivity of order 10-**3 to 10**-2 TeV-**1 at a 500 GeV ILC, and of order 10**-3 TeV-**1 at a 1 TeV ILC and a 3 TeV CLIC, and (b) gamma gamma to WWWW at a 3 TeV CLIC can test all the anomalous couplings g_HVV's to the 3 sigma sensitivity of order(10**-3} to 10**-2 TeV.

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