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## Symmetry and geometry in generalized Higgs sector

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We formulate a generalization of Higgs effective field theory (HEFT) including arbitrary number of extra neutral and charged Higgs bosons (generalized HEFT, GHEFT). Using the geometrical form of the GHEFT Lagrangian, which can be regarded as a nonlinear sigma model on a scalar manifold, it is shown that the scalar boson scattering amplitudes at high energy are described in terms of the Riemann curvature tensor (geometry) of the scalar manifold. The one-loop divergences in the oblique correction parameters S and U can also be written in terms of the Killing vectors (symmetry) and the Riemann curvature tensor (geometry). It is found that perturbative unitarity of the scattering amplitudes involving the scalar fields demands the flatness of the scalar manifold. The relationship between the finiteness of the electroweak oblique corrections and perturbative unitarity of the scattering amplitudes is also clarified in this language: we verify that once the tree-level unitarity is ensured, then the one-loop finiteness of the S and U parameters is automatically guaranteed.

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