

## 2HDM+S effective potential approach to some Higgs decays

*Thursday 27 September 2012 14:00 (20 minutes)*

We consider the most general CP-conserving renormalizable effective scalar potential involving two doublets plus one singlet Higgs and satisfying the electroweak gauge symmetry. After deriving the electroweak-symmetry breaking conditions, we focus our attention on specific cases, characterized by specific symmetry properties and/or relations to supersymmetry-inspired extensions of the Standard Model (e.g.  $m$ /NMSSM, UMSSM). We then investigate the question of the reconstruction of the potential parameters from the Higgs masses and mixing angles and show that in some specific cases, such as the one of an underlying NMSSM, an accuracy at the order of leading-logarithms is achievable with minimal effort. We finally study a few phenomenological consequences for this latter model: noteworthy effects in Higgs-to-Higgs decays indeed develop, with an impact on collider constraints or the Dark-Matter relic density. We performed a comparison of our procedure with two public codes, NMSSMTools and micromegas, and found some improvement in particular regions of parameter space.

**Primary author:** Dr CHALONS, Guillaume (TTP-KIT)

**Co-author:** Dr DOMINGO, Florian (TTP-KIT)

**Presenter:** Dr CHALONS, Guillaume (TTP-KIT)

**Session Classification:** Parallel Session 1: Particle Phenomenology