EXTRACTION OF ANOMALOUS $ZZ\gamma$, $Z\gamma\gamma$, AND ZZV COUPLINGS

Revised March 2000 by C. Caso (Univ. of Genova) and A. Gurtu (Tata Inst.)

In the reaction $e^+e^- \to Z\gamma$, deviations from the Standard Model for the $ZV\gamma$ couplings may be described in terms of 8 parameters, h_i^V $(i = 1, 4;\ V = \gamma, Z)$ [1]. In this formalism h_1^V and h_2^V lead to CP-violating and h_3^V and h_4^V to CP-conserving effects. All these anomalous contributions to the cross section increase rapidly with center-of-mass energy. In order to ensure unitarity, these parameters are usually described by a form-factor representation, $h_i^V(s) = h_{io}^V/(1 + s/\Lambda^2)^n$, where Λ is the energy scale for the manifestation of a new phenomenon and n is a sufficiently large power. By convention one uses $n = 3$ for $h_{1,3}^V$ and $n = 4$ for $h_{2,4}^V$. Usually limits on h_i^V's are put assuming some value of Λ (sometimes ∞).

Above the $e^+e^- \to ZZ$ threshold, deviations from the Standard Model may be described by means of four anomalous couplings f_i^V $(i = 4, 5; V = \gamma, Z)$ [2]. The anomalous couplings f_5^V lead to violation of C and P symmetries while f_4^V introduces CP violation. These couplings are zero at tree level in the Standard Model.

Reference

1. U. Baur and E.L. Berger Phys. Rev. **D47**, 4889 (1993).
2. K. Hagiwara *et al.*, Nucl. Phys. **B282**, 253 (1987).