

# The Stimulated Breit-Wheeler Process as a Source of Background $e^+e^-$ Pairs at the International Linear Collider

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The bunch fields at the interaction point of the ILC have a dominant effect on background pair production. The Breit-Wheeler, Bethe-Heitler and Landau-Lifshitz processes have all been studied in detail. The number of background pairs per bunch crossing due to these processes is well known. However the effect of the bunch fields on the Breit-Wheeler process has not been calculated. This Stimulated Breit-Wheeler (or Stimulated Two Photon Pair Production) process, contains cross-section resonances, and significant numbers of background pairs may result from it. Presented here is a theoretical calculation and numerical investigation of the Stimulated Breit-Wheeler cross-section. This is a full QED calculation, and the external field is treated with the semi-classical approximation. The form of the bunch field considered is a plane wave, constant crossed electromagnetic field. Calculation of resonances involved inclusion of the Electron Self Energy in the external field. The end goal of the numerical investigation is the characteristics of new background pairs that can be expected at the ILC.

## Summary

Some QED work on new sources of background pairs

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