A STUDY OF THE PROCESS $e^+e^- \rightarrow \mu^+\mu^-(\gamma)$ AT $\sqrt{s} < m(Z^\circ)$, $\sqrt{s} = 189$ GeV AND $\sqrt{s} = 192$ GeV USING THE OPAL DETECTOR AT LEP

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Synopsis

Measurements of cross-sections, angular distributions and forward-backward asymmetries of the process $\mathrm{e}^+\mathrm{e}^- \rightarrow \mu^+\mu^-(\gamma)$ have been made in two separate analyses which use data recorded using the OPAL detector at LEP in 1993, 1994, 1995 and during 1998 and 1999.

The first analysis involved separating radiative events from LEP I data to make measurements at an effective centre-of-mass energy below the Z° mass threshold. The second analysis involved using data at the highest available collision energies to make similar measurements. However, in this case the data were separated into two classes of event so that measurements could be made using events at full energy and those that had undergone initial state radiation (ISR).

The results from these analyses were compared to the results obtained from similar analyses preformed by the other LEP collaborations, and to the predictions of the standard model theory. No deviations from the theoretical expectations were found.