Two-photon physics with the OPAL detector

The OPAL detector has collected data for centre-of-mass energies $\sqrt{s_{ee}}$ ranging from the mass of the Z^0 boson M_{Z^0} up to 172 GeV. This data provides a rich field for the analyses of two-photon reactions which are used to study the internal structure of the photon.

Two-photon scattering processes are usually experimentally divided according to the virtuality of the interacting photons, which is related to the scattering angle of the electrons. In this presentation results for untagged events (no $e^{\pm}$ is observed in the detector) and for singly-tagged events (one $e^{\pm}$ is observed) will be shown.

The untagged events can be described in terms of the scattering of two quasi-real photons. The analyses of these events focus on the flow of hadronic energy and on the production of jets. The jet-production was found to be well described by next-to-leading order QCD calculations. The singly-tagged events will be discussed in the framework of deep inelastic electron-photon scattering. The main interest here is the measurement of the structure functions of the photon in hadronic and leptonic final states. The hadronic structure function and its evolution with $\ln Q^2$ have been determined in the range from 7.5 - 135 GeV^2.

The results obtained help to better understand the structure of the photon. The analyses will be extended into a new energy regime within the LEP2 programme.