W physics at LEP

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Abstract

After the first observations of W bosons in leptonic interactions, about 1000 WW candidate events per experiment have been collected at LEP2. This allows the measurement of the WW production cross section at different centre–of–mass energies, as well as W decay branching fractions. The W hadronic branching fraction can be converted into a test of the unitarity of the CKM matrix, or into an indirect determination of the matrix element $|V_{cs}|$. A more direct measurement comes from a charm tag performed on jets from W decays, exploiting their heavy–quark characteristics in an environment with small b–quark contamination. The W mass has been measured via the cross section (in the threshold region) and the direct reconstruction of the W decay products, using different techniques to account for the distortions due to experimental effects. The cross sections, together with distributions of W production and decay angles, are used to measure trilinear gauge boson couplings, and to put constraints on possible anomalies with respect to the standard model values.