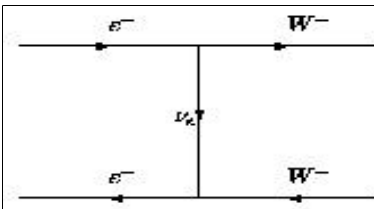
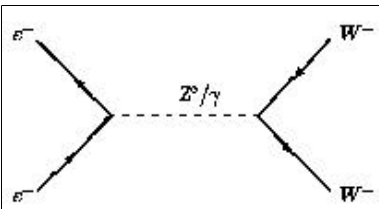


W-pair cross-section and W Branching ratios at DELPHI

G. Gomez-Ceballos (M.I.T.)

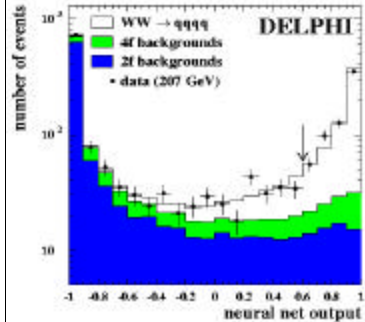


*** W Physics was one of the main goals at LEP2***
Close to the final DELPHI results!

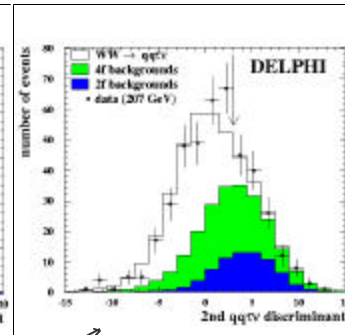
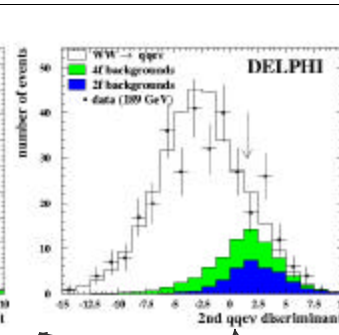
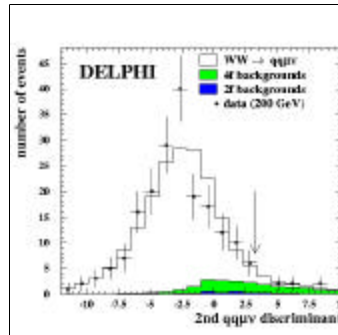
Selection: Different multidimensional discriminant techniques used in the selection

- $W^+W^- \rightarrow qq'q''q''' \Rightarrow$ Neural Network (Eff~80%, Bg~15%)
- $W^+W^- \rightarrow qq'lv \Rightarrow$ IDA (Eff~75%, Bg~10%)
- $W^+W^- \rightarrow lv'l'v' \Rightarrow$ Neural Network (Eff~65%, Bg~10%)

"CC03" diagrams of W-pair production at LEP2

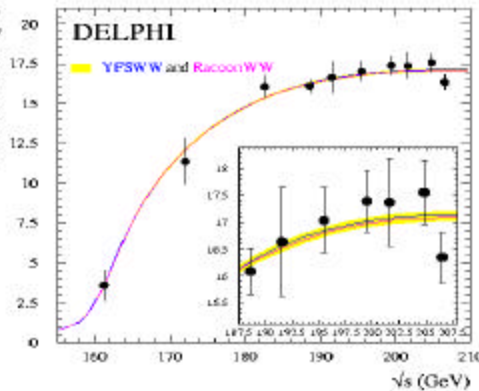
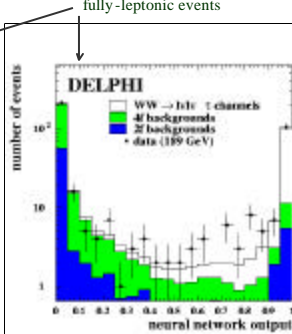
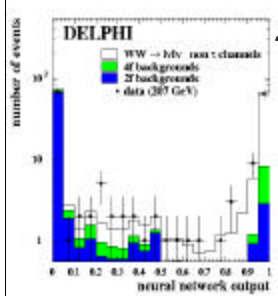


Distribution of the Neural Network output variable for four-jets events at $E_{cm} = 207$ GeV



Distribution of final discriminants for the semi-leptonic selection

Distribution of the two types of Neural Network used for the selection of fully-leptonic events



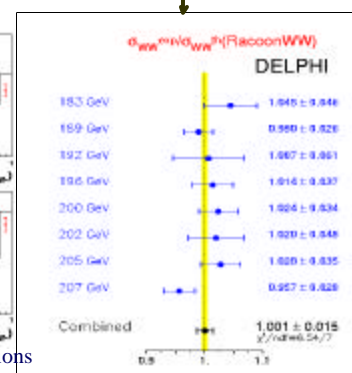
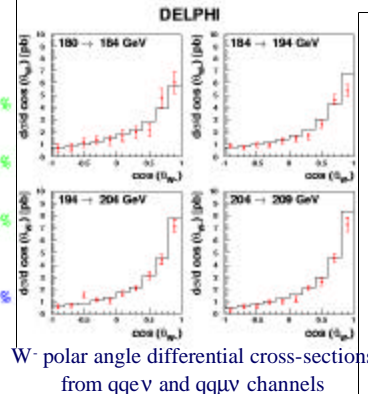
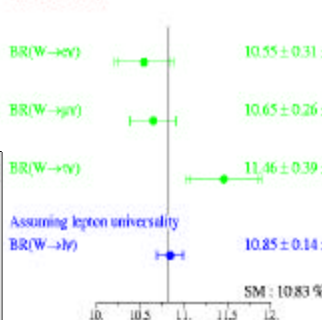
Measurements of the WW cross-section compared with the Standard Model

Results in agreement with the Standard Model prediction!

Detailed study of systematic errors:

- ✓ Modelling of 4-jet Background from qq
- ✓ Background cross-sections
- ✓ Fragmentation modelling
- ✓ FSI
- ✓ Radiative corrections
- ✓ Luminosity determination
- ✓ Detector effects
- ✓ MC statistics

DELPHI W decay Branching Ratios 183-207 GeV



Source	$\sigma_{WW}^{qq'v}$ [pb]	$\sigma_{WW}^{qq'vv}$ [pb]	σ_{WW}^{tot} [pb]
Four-jet modelling	± 0.051	± 0.014	
Background or res-rescues	± 0.008	± 0.016	± 0.026
Fragmentation	± 0.045	± 0.003	
Final state interactions	± 0.005		
Radiative corrections	± 0.008	± 0.008	± 0.016
Luminosity (theor)	± 0.011	± 0.010	± 0.016
Luminosity (exp)	± 0.045	± 0.045	± 0.011
Detector effects	± 0.045	± 0.003	± 0.033
Monte Carlo statistics	± 0.006	± 0.014	± 0.033
Total	± 0.068	± 0.063	± 0.048

Breakdown of systematic errors on the partial WW cross-sections at $E_{cm} = 200$ GeV

W polar angle differential cross-sections from qq'v and qq'vv channels

Ratios between measured and predicted WW cross-sections with the DELPHI data