Appendix C

C.1 Electron microscope scans of different fibres

An electron microscope was used to scan a selection of the experimental fibres giving some indication of the core and cladding ellipticity.



Figure C.1 Electron microscope scan of S-SMF 1, S-SMF-2 and DSF 4.



Figure C.2 Electron microscope scan of DSF Spun 2, DSF Spun 4 and DEDF 2.



Figure C.3 Electron microscope scan of EDF 3, EDF 4 and EDF 5. The ellipticity for EDF 3 has been measured as $e^2 = 13\%$ and for EDF 5 as $e^2 = 25\%$ from the above backscatter scans.

C.2 Index profile from far field scan of DEDF 1



Figure C.4 Refractive index profile from far field scan of DEDF 1 (measured at NPL, UK). The segmented core of DEDF 1 is apparent and also shows a small central dip. The refractive index difference has been estimated $\Delta n = 0.0155$ (1 ± 3.2%) which gives a $\Delta = 0.0106$ (1 ± 3.2%) with $n_1 = 1.46$. No core ellipticity could be seen in all three measured fibre samples within the measured resolution ($e^2 \sim 2\%$).

C.3 Index profiles of different preforms using a preform analyser

C.3.1 Profile scan of the DEDF manufactured at BT Labs (DEDF 2)



Figure C.5 Refractive index profile of preform of DEDF 2 showing the triangular profile with 5 layers of the core fabricated using MCVD (measured at BT Labs).



Figure C.6 Measured ellipticity of the core of DEDF-2 (see Table 6.1 in Chapter 6), using a preform analyser at BT Labs. The core diameter has been measured along the preform by scanning two arbitrary orthogonal positions. This means that the measured ellipticity is the minimum expected ellipticity and the actual ellipticity is likely to be higher. The grey shaded areas correspond to the measured fibre sample positions.



C.3.2 Profile scans from EDFs manufactured at BT Labs (EDF 1 to 5)

