Transverse modulus of fibres

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The transverse modulus of fibres is important for modelling the performance of composite materials; however its determination by simple transverse compression is difficult because of fibre size and geometry. To test carbon fibres of 5-10 µm diameter a micro-compression tester is being constructed with the ability to measure to better than 3 nm displacement and 4 mN compressive force. Analysis of the data from the compression test is complicated as there are at least three different mathematical models reported in the literature. These models have been assessed with data from the compression of macro-scale elastic cylinders made from natural rubber, polyurethane and Perspex.