

Abstract Submitted
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Drawing of microstructured optical fibres with pressurisation of the internal channels MICHAEL CHEN, YVONNE STOKES, University of Adelaide, PETER BUCHAK, DARREN CROWDY, Imperial College London, HEIKE EBENDORFF-HEIDEPRIEM, University of Adelaide — Microstructured optical fibres are distinguished from solid optical fibres by the large number of internal air channels running along their length. These fibres are manufactured by heating and stretching a preform, which has some cross-sectional pattern of holes. In stretching the preform with a diameter of 1-3cm to a fibre with a diameter of the order of 100 micrometers, the cross-sectional hole pattern changes in scale but is also deformed due to surface tension. A practical way of countering this deformation is to introduce pressurisation in the internal channels. This pressure acts against surface tension and potentially provides an extra degree of control over the shape of the internal channel geometry. We generalise an existing model of fibre drawing to include channel pressurisation and present examples of pressurised fibre drawing for several cross-sectional geometries of practical importance.

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