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## **Simple method for manufacturing and optical characterization of tapered optical fibres**

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### **Abstract:**

Photonic devices often use light delivered by a single-mode telecommunication fibre. However, as the diameter of the core of the optical fibre is of 10 microns, and the transverse dimensions of the photonic waveguides are usually micrometer or less, there is an issue of incompatibility. The problem may be solved by application of tapered optical fibres. For efficient light coupling, the taper should be prepared so as to create a beam of long focal length and small spot diameter in the focus. The article describes the design, fabrication and characterization of tapered optical fibres prepared with a fibre-optic fusion splicer. We modelled the tapers with FDTD method, for estimation of the influence of the tapered length and angle on the spot diameter and the focal length of an outgoing beam. We fabricated tapers from a standard single mode fibre by the Ericsson 995 PMfi- bre-optic fusion splicer. We planned the splicing technology so as to get the needed features of the beam. We planned a multistep fusion process, with optimized fusion current and fusion time. The experimental measurements of best tapered optical fibres were carried out by the knife-edge method.