TECHNOLOGY OFFER

A photonic crystal fibre for transferring radially polarised light beam and a method of manufacturing such a fibre

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Institute of Microelectronics and Photonics

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Patent information

Technology readiness level: 2-3

Title: A photonic crystal fibre for transferring radially polarised light beam and a method of manufacturing such a fibre

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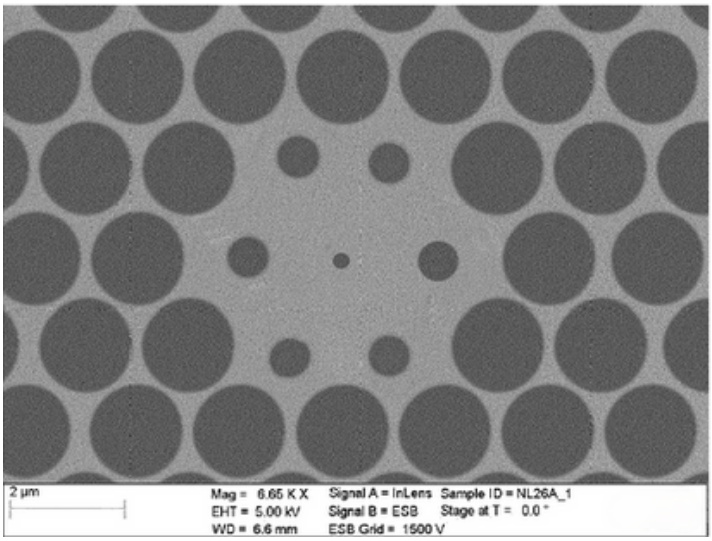
Jurisdictions: Germany, France, Great Britain, Poland

The present invention relates to a photonic crystal fiber for transferring radially polarised light beam and a method of manufacturing such a fibre.

In this technology a core is made of glass and a photonic cladding surrounding the core comprises nanoholes filled with air or nanorods. The core contains nano-inclusion made of glass or metal. The presence of nano-inclusion introduces birefringence, which causes narrowing of fundamental mode-field area and significantly impedes the excitation of the fundamental mode. This allows to couple and transmit radially polarised light.



Technology Summary

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The potential behind the technology

Although several methods of forming such beams have already been proposed, there are only a few solutions allowing to maintain unchanged polarisation of the beam during propagation inside the fibre.

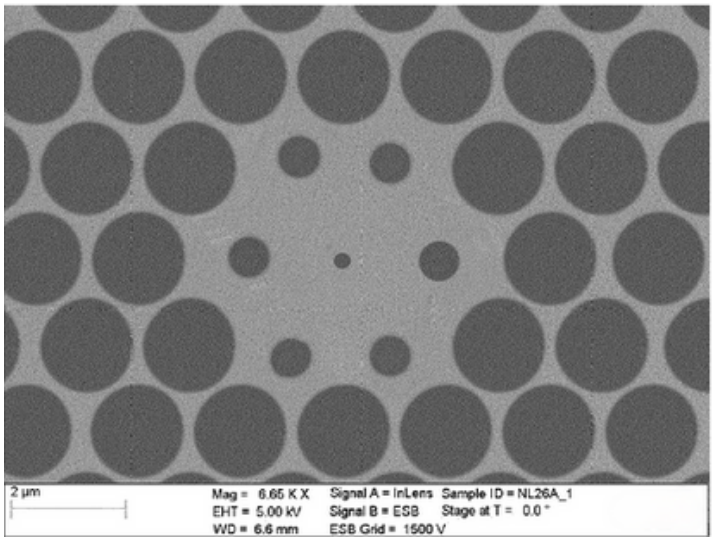
Technology Advantages

One of the main advantages of our solution is that presented method of manufacturing optical waveguide is faster than other methods. What is more, patented optical waveguide can guide light not only through a well-known total internal reflection mechanism but using also photonic bandgap effect. The application of a dielectric-metallic inclusion in the optical fibre according to the invention, in contrast to purely metallic inclusion allowed to reduce the attenuation for the radial mode by two orders of magnitude.

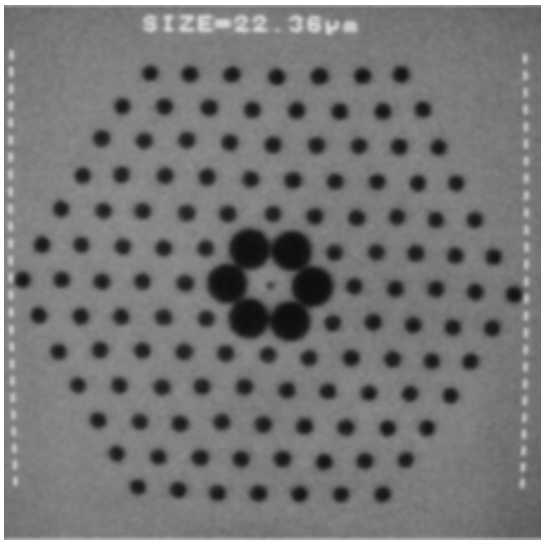
Application

Such a fibre is used mainly in telecommunications, subwavelength imaging, measuring interferometry and optical fibre sensors.

a)



b)



A photograph of all-solid optical fibre with nano-inclusion in the core in which diameters of the nanorods of the inner ring are: a) smaller and b) bigger than the diameters of the nanorods of the outer ring of the photonic cladding.

Collaboration type

License agreement or sale agreement

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