HOLLOW-CORE ANTI-RESONANT OPTICAL FIBER WITH SINGLE-MODE AND ULTRA-LOW LOSS

Abstract

The present disclosure relates to a hollow-core anti-resonant optical fiber with a single-mode and an ultra-low loss, including an outer cladding and an inner cladding which is formed by nested structural elements arranged circumferentially at an interval along an internal surface of the outer cladding and connected to the internal surface of the outer cladding and clads a central cavity to form an equivalent circular fiber core cavity, the nested structural element including two or more layers of nested glass tubes having different radii, characterized in that, an auxiliary inner cladding is disposed along a circumference of the internal surface of the outer cladding and includes auxiliary nested structural elements, the auxiliary nested structural elements are arranged at an interval along the circumference of the internal surface of the outer cladding in an alternate manner with the nested structural elements and are connected to the internal surface of the outer cladding, and an equivalent circular mode-filtering cavity, tangent to an auxiliary nested structural element and nested structural elements on two adjacent sides, is formed between the auxiliary nested structural element and the nested structural elements on two adjacent sides. The present disclosure increases a loss of a higher-order mode while reducing a loss of a fundamental mode by changing a structure of a cladding and thus achieves transmission with a low loss under a high-purity single-mode.

Fig. 1.