CLAIMS

The invention claimed is:

1. An integrated polarization splitter comprising a multimode interference coupler which in turn comprises:

an input waveguide intended to feed a transverse electric (TE) mode and a transverse magnetic (TM) mode of an optical signal to the multimode interference coupler,

a first output waveguide intended to transmit the transverse electric (TE) mode of the optical signal,

a second output waveguide intended to transmit the transverse magnetic (TM) mode of the optical signal,

wherein the multimode interference coupler additionally comprises an anisotropic multimode waveguide region formed by a plurality of sections of a core material and a plurality of sections of a cladding material, respectively alternately arranged in a periodic way with a period (Λ) smaller than the wavelength of the optical signal propagated through said anisotropic multimode waveguide region; and being wherein the plurality of sections of core material and the plurality of sections of cladding material of the anisotropic multimode waveguide region form an angle (α) greater than zero with a plane perpendicular to the input waveguide, the first output waveguide and the second output waveguide, being the splitter characterised in that the angle (α) is greater than zero, and wherein the polarization splitter comprises:

a first taper connected to the input waveguide;

a second taper connected to the first output waveguide; and

a third taper connected to the second output waveguide;

wherein each one of: the first taper, the second taper and the third taper, respectively, comprise:

a waveguide with variable width, and

sections of core material and sections of cladding material arranged in an alternating and periodic way.

2. The polarization splitter according to claim 1, characterised in that the angle (α) is comprised between 5° and 25°.

3. The polarization splitter according to claim 2, characterised in that the angle (α) is comprised between 10° and 20°.

4. The polarization splitter according to claim 1, characterised in that the plurality of sections of core material comprise a central gap filled by cladding material.

5. The polarization splitter according to claim 1, characterised in that the first taper, the second taper, the third taper, respectively, comprise a central bridge made of core material that joins the sections of core material, the width of each central bridge being inversely proportional to the width of the respective taper.

6. The polarization splitter according to claim 1, characterised in that the anisotropic region of the multimode interference coupler has constant geometric properties throughout the length thereof.

7. The polarization splitter according to claim 1, characterised in that the anisotropic region of the multimode interference coupler comprises a variable geometry throughout the length thereof.

8. The polarization splitter according to claim 1, characterised in that at least one waveguide selected among: the input waveguide, the first output waveguide and the second output waveguide is arranged with an angle different than 90° in an interface with the multimode interference coupler.

9. The polarization splitter according to claim 1, characterised in that the core material is silicon.

10. The polarization splitter according to claim 9, characterised in that the core material is arranged on an insulator layer.