5. Conclusion

PhCs made on $LiNbO_3$ waveguides have performances that strongly depend on the vertical confinement of the propagating guided mode. The reflection behavior of the PhCs in the forbidden gap has been demonstrated by means of an experimental setup that gives the spectral density of the reflected light thanks to an optical fibered circulator. The Fourier transform of this signal allows a direct observation of reflection peaks in the impulse response correlation. To our knowledge, it is the first time that swept-source OCT technique is used to characterize PhC devices. Reflection coefficient of almost 83% is reported for an APE waveguide. Moreover, we report the first demonstration of a photonic bandgap in Ti-indiffused waveguides. Enlarging a Ti-indiffused waveguide to a width of 12µm has indeed enabled to show a small photonic bandgap effect while this effect is not observed for a 7 µm width Ti-indiffused waveguide. Another approach has been tested that relies on the exploitation of ridge waveguides to improve the properties of PhCs made on $LiNbO_3$ waveguides. Finally, we have opened the way for the fabrication of a $LiNbO_3$ 3D-PhC through an original and easy-to-implement technology.

Acknowledgments

This work was supported by the "MUSARAIGNE" DGA REI project contract number 0734022, and by the network CDMO+/ROP project ref MC/NL n°11-104.