[21] A. Politi, M.J. Cryan, J.G. Rarity, S. Yu, and J.L. O'Brien, Science **320**, 646 (2008).

[22] Y. Bromberg, Y. Lahini, R. Morandotti, and Y. Silberberg, arXiv:0807.3938v1 [quant-ph] (2008).

[23] S. Longhi, Phys. Rev. Lett. **101**, 193902 (2008).

[24] T.A.B. Kennedy and E.M. Wright, Phys. Rev. A **38**, 212 (1988).

[25] U. Leonhardt, Rep. Prog. Phys. **66**, 1207 (2003); J. Skaar, J.C.G. Escartin, and H. Landro, Am. J. Phys. **72**, 1385 (2004).

[26] Y. Lai and H.A. Haus, Phys. Rev. A **40**, 844 (1989); E.M. Wright, Phys. Rev. A **43**, 3836 (1991); P.L. Hagelstein, Phys. Rev. A **54**, 2426 (1996)

[27] A.B. Matsko and V.V. Kozlov, Phys. Rev. A **62**, 033811 (2000).

[28] B. Yurke and M. J. Potasek, J. Opt. Soc. Am. B **6**, 1227 (1989); C. Sibilia, V. Schiavone, M. Bertolotti, R. Horak, and J. Perina, J. Opt. Soc. Am. B **11**, 2175 (1994); B Crosignani, P Di Porto and A Treppiedi, Quantum Semiclass. Opt. **7**, 73 (1995); J.M. Fini, P.L. Hagelstein, and H. A. Haus, Phys. Rev. A **60**, 2442 (1999); D. Rand, K. Steiglitz, and P.R. Prucnal, Phys. Rev. A **71**, 053805 (2005).

[29] H.I. Yuen, and J.H. Shapiro, IEEE Trans. Inf. Theory **IT-24**, 657 (1978); M.I. Kolobov, Rev. Mod. Phys. **71**, 1539 (1999); M. Bache, E. Brambilla, A. Gatti, and L.A. Lugiato, Phys. Rev. A **70**, 023823 (2004); A. Aiello and J.P. Woerdman, Phys. Rev. A **72**, 060101(R) (2005); M. Tsang and D. Psaltis, Phys. Rev. A **73**, 013822 (2006).

[30] In the Heisenberg picture, the state vector of the system would be constant whereas the operator $\hat{\phi}$ evolve according to $i\hbar(d\hat{\phi}/dz) = [\hat{\phi}, \hat{H}]$. One can easily check that, with the Hamiltonian operator given by Eq.(18), the evolution equation of the operator $\hat{\phi}$ is precisely Eq.(3), where the c-field ϕ is replaced by the operator $\hat{\phi}$.

[31] More precisely, the monochromatic limit is attained by assuming in Eqs.(21) and (22) $f^{(n)}(\mathbf{q}, \mathbf{\Omega}, z) = g^{(n)}(\mathbf{q}, z)h(\Omega_1)h(\Omega_2)...h(\Omega_n)$, where $h(\Omega)$ is a spectrally narrow function at around $\Omega = 0$ normalized such that $\int d\Omega |h(\Omega)|^2 = 1$, and $g^{(n)}(\mathbf{q}, z)$ satisfies Eq.(22) with $\Omega_l = 0$. The operator $\hat{\phi}(\rho)$ is then formally defined as $\hat{\phi}(\rho) = \int d\Omega h(\Omega)\hat{\phi}(\rho, \Omega)$. The n-photon number state $|f^{(n)}\rangle$, given by Eq.(21), takes then the simplified form $|f^{(n)}\rangle = (1/(\sqrt{n!}) \int d\mathbf{q} g^{(n)}(\mathbf{q}, z)\hat{\phi}^\dagger(\rho_1)\hat{\phi}^\dagger(\rho_2)...\hat{\phi}^\dagger(\rho_n)|0\rangle$.

[32] As the waveguides W_1 and W_2 are symmetrically placed at opposite sides from the slab waveguide S, if $(c_1(z), c_2(z), c_k(z))$ is a solution to Eqs.(5-7) with initial condition $c_1(0) = 1$, $c_2(0) = 0$ and $c_k(0) = 0$, then $(c_2(z), c_1(z), c_k(z))$ is the solution to Eqs.(5-7) with reversed initial condition $c_1(0) = 0$, $c_2(0) = 1$ and $c_k(0) = 0$. Light tunnelled into the slab waveguide S is thus given by the same superposition of continuous modes ($\sim \int dk c_k(z) u_k(\rho)$) for the two different initial conditions. This means that the last two terms on the right hand sides of Eqs.(38) and (39) are equal each other.

[33] R. Ghosh and L. Mandel, Phys. Rev. Lett. **59**, 1903 (1987); L. Mandel, Rev. Mod. Phys. **71**, S274 (1999).

[34] K. Wang, J. Phys. B **39**, R293 (2006); W.P. Grice and I.A. Walmsley, Phys. Rev. A **56**, 1627 (1997).