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**Tuning of the spontaneous emission in a one-dimensional photonic crystal** ELIZABETH GALINDO, ADAN S. SANCHEZ, PETER HALEVI — The optical properties of a photonic crystal (PC) can be tuned if one of its constituents is a semiconductor [1]. Changing the free carrier concentration (electrons or holes) in the semiconductor, it is possible to modify its dielectric constant, and, consequently, the band structure or the density of optical states of the PC. On the other hand, the rate of spontaneous emission of an atom or a molecule depends on the density of states of its environment. Thus, the rate of emission of an atom immersed in a PC is different from the rate of emission in vacuum. In this work, we compute the rate of spontaneous emission of an Er ion in a one-dimensional, tunable PC made of alternating layers of Si and air. The rate of spontaneous emission can be changed about 30 around its value in the homogeneous medium. [1] P. Halevi and F. Ramos-Mendieta, *Phys Rev Lett.* 85, 1875 (2000); A. S. Sanchez and P. Halevi, *J. Appl. Phys.* 94, 792 (2003).

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