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Local density of states analysis of surface wave modes on truncated photonic crystal surfaces with nonlinear material MERLE ELSON, KLAUS HALTERMAN, Naval Air Warfare Center — The local density of states and response to an incident plane wave of a finite sized photonic crystal (PC) with nonlinear material (NLM) is analyzed. Of particular interest is the excitation of surface wave modes at the truncated surface of the PC, which is collocated with the NLM material. We compute the 2D Green function of the PC with linear material and then include the Kerr NLM in a self-consistent manner. The 2D PC consists of a square array of circular rods where one row of the rods is semi-circular in order to move the surface wave defect mode frequency into the band gap. Since the surface modes are resonant at the interface, the NLM should experience at least an order of magnitude increase in field intensity. This is a possible means of increasing the efficiency of the PC as a frequency conversion device.

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