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Title:	Enhancement of "logical" responses by noise in a bistable optical system
Authors:	Singh, K.P. (/jspui/browse?type=author&value=Singh%2C+K.P.)
Keywords:	Binary inputs Bistable lasers Bistable optical systems
Issue Date:	2011
Publisher:	American Physical Society
Citation:	Physical Review E - Statistical, Nonlinear, and Soft Matter Physics, 83 (4), art. no. 046219
Abstract:	We verify numerically the phenomenon of logical stochastic resonance in a polarization bistable laser. Namely, we show that when one presents two weak binary inputs to the laser system, the response mirrors a logical or(nor) output. The reliability of the logic operation is dependent on the noise intensity. As one increases the noise, the probability of the output reflecting the desired or(nor) operation increases to nearly unity and then decreases. We also demonstrate that changing the bias morphs the output into another logic operation, and(nand), whose probability displays analogous behavior. Furthermore, we highlight the possibility of processing two logic gates in parallel in our laser system by exploiting two coupled orthogonal polarizations that can be detected simultaneously. This suggests that the computational power of the optical system may be enhanced by this additional potential for parallel processing. © 2011 American Physical Society
Description:	Only IISERM authors are available in the record.
URI:	http://www.lajpe.org/sep10/400_Ashok_Mody.pdf (http://www.lajpe.org/sep10/400_Ashok_Mody.pdf)
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