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Photon-Axion Mixing Effects and Mirror Cavity Experiments CAROL SCARLETT, MIKHAIL KHANKHASAYEV, Florida A&M University — It is well known that the existence of a light pseudoscalar particle called the axion can solve fundamental physical problems (e.g. the strong CP problem). We discuss the possibility of detection axions via their mixing with photons in a mirror cavity. The mixing of photons with axions in an inhomogeneous magnetic field creates a vacuum polarization that splits a light beam. In a mirror cavity, this splitting results in a bifurcation effect. Here we present the formalism to provide an effective model to study bifurcation and to account for nonzero axion masses. Both of these represent new and significant developments to furthering the current body of knowledge on the subject.

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