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Probing the two light Higgs scenario in the NMSSM with a low-mass pseudoscalar

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We propose a simultaneous collider search strategy for a pair of scalar bosons in the NMSSM through the decays of a very light pseudoscalar. The massive scalar has a mass around 126 GeV while the lighter one can have a mass in the vicinity of 98 GeV, thus explaining an apparent LEP excess, or be much lighter. The successive decay of this scalar pair into two light pseudoscalars, followed by leptonic pseudoscalar decays, produces clean multi-lepton final states with small or no missing energy. We emphasize that a dedicated experimental search for multi-lepton final states can be a useful probe for this scenario and, in general, for the NMSSM Higgs sector.

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