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Associated Single Photons as Signals for a Doubly Charged Scalar at Linear e- e- Colliders

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Doubly charged scalars, predicted in many models having exotic Higgs representations, can in general have lepton-number violating (LFV) couplings. The basis of most searches for this charged scalar has been to look for its direct production and its subsequent decay to like-sign final state leptons. In this work we show that by using an associated monoenergetic final state photon seen at a future linear e-e- collider, we can have a clear and distinct signature for a doubly-charged resonance and also determine its mass rather precisely. We also estimate the strength of the Delta L=2 coupling which can be probed in this way at sqrt{s}=1 TeV, as a function of the recoil mass of the doubly-charged scalar.

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