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New method to study the photon strength function using the beta-decay of unstable nuclei

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The photon strength function is a fundamental property of the atomic nucleus that can be linked with many different areas of nuclear science. In particular, a knowledge of the photon strength function can be applied in statistical-model reaction calculations to constrain neutron capture rates useful for nuclear astrophysics and other applications. A new method has been developed which takes advantage of beta-decay to populate high-energy states in a daughter nucleus. This preparation is combined with a total absorption spectrometer to record the subsequent gamma-ray cascade and the overall technique is the so-called beta-Oslo method. The technique is applicable to very low production rates ($\sim$ 1 pps) and, thus, can be used to look at trends across a wide range of neutron and proton numbers. A description of the technique, and preliminary results on neutron-rich nuclei near Z = 28 and N = 40 will be presented.