A new look at the low-energy enhancement in photon strength*

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Over the last decade several measurements in medium mass nuclei (mainly by the Oslo group) have reported a low-energy enhancement in the photon strength function. Although, much effort has been invested in unraveling the mysteries of this effect, its origin is still not understood. I will discuss our work using a completely model independent experimental approach as we investigate the existence and origin of this enhancement.

Our experiment was designed to study statistical feeding from the quasi-continuum (below Sn) to individual low-lying discrete level. The measurement was carried out at the 88-Inch cyclotron of the Lawrence Berkeley National Laboratory. 95Mo nuclei were produced in the 94Mo(d,p) direct reaction which was chosen to populate states high in excitation rather than high in angular momentum. The STARS-LIBERACE detector array consisting of Compton suppressed HPGe Clover-type detectors and large area segmented annular silicon detectors has been used to detect gamma-radiation and charged particles in coincidence.
A key aspect to successfully study gamma decay from the region of high-level density is the detection and extraction of correlated particle-gamma-gamma events. Detected proton energies in the silicon detectors infer the entrance excitation energy into the residual nucleus 95Mo produced in the reaction. Gating on gamma-transitions originating from low lying discrete levels specifies the state fed by statistical gamma-rays. Any particle-gamma-gamma event in combination with the energy sum requirement ensures a clean and unambiguous determination of the initial and final state of the observed gamma rays. With these requirements the statistical feeding to individual discrete levels is extracted on an event-by-event basis. Each observed transition is corrected for efficiency of the statistical and discrete gamma-ray energies.

I will present the latest results and compare our 95Mo data to the photon strength function measured at the University of Oslo. In particular I will address questions regarding the existence and origins of the low-energy enhancement in the photon strength function.

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