The photon strength function is a fundamental feature of atomic nuclei and describes the energy-dependent probability for the absorption and emission of photons. These transitions are dominated by the electric dipole strength. The breaking of the isospin-symmetry results in the generation of electric dipole moments in the atomic nucleus. For this reason, knowledge about dipole excitations in small atomic nuclei provide fundamental information about isospin-asymmetric neutron stars, which are among the most massive objects in the universe.

The disentanglement of individual excitation modes and the quantification of isoscalar and isovector components of low-energy electric dipole excitations are subjects of ongoing research. Various experimental and theoretical approaches are currently discussed. Systematic measurements along isotopic or isotonic chains provide information about the behavior of these modes with changing properties of the atomic nucleus.

Since the photon strength function describes the statistical behavior of transitions between states in the atomic nucleus, it is fundamental for many nucleosynthesis processes. This is especially true in hot and explosive scenarios. Neutron capture reactions are essential for the creation of heavy elements in the universe and the photon strength function is an important input of model calculations for these reactions. These are of great importance especially for so-called waiting-point nuclei. One of these nuclei is ^{86}Rb, which plays an important role in the understanding of nucleosynthesis processes in stars on the asymptotic giant branch.

The method of nuclear resonance fluorescence with real photons in the entrance channel is very selective on dipole transitions and, therefore, is a widely used approach to experimentally determine the dipole strength in atomic nuclei. Three complementary measurements were analyzed within this work. Two of them with bremsstrahlung beams at the γELBE facility in Dresden, Germany and one with quasi mono-energetic beams with 18 beam settings at the HIγS facility, Durham, NC, USA. The results are integrated into the systematics of the photoabsorption cross sections of the $N = 50$ isotones and are compared with existing data in the energy range of the Giant Dipole Resonance. Furthermore, the influence of the new results on statistical model calculations for the neutron capture cross-section at ^{86}Rb is investigated.