

Scientific Report

The purpose of the visit to the University of Cambridge was to perform thorough optical characterization and nonlinear experiments on newly fabricated all-dielectric mirror GaN microcavity structures prepared at FORTH. In this direction we have built experimental setup dedicated to characterization in the near UV spectral region, which allows us to perform micro-Reflectivity experiments.

Below we provide some initial μ -reflectivity data that has been acquired during the visit. Figure 1 shows contour plots of angle resolved broadband reflectivity spectra acquired within a range of angle of 0° - 30° for three different detunings on GaN microcavity corresponding to different GaN membrane thicknesses. Clear signature of a well defined lower polariton branch can be observed as well as well defines stop-band of the dielectric DBR mirror. The corresponding cavity quality factor Q is ~ 200 . Further experiments are in progress to characterized the angle resolved luminescence for the same detunings to unambiguously prove the existence of strong coupling regime.

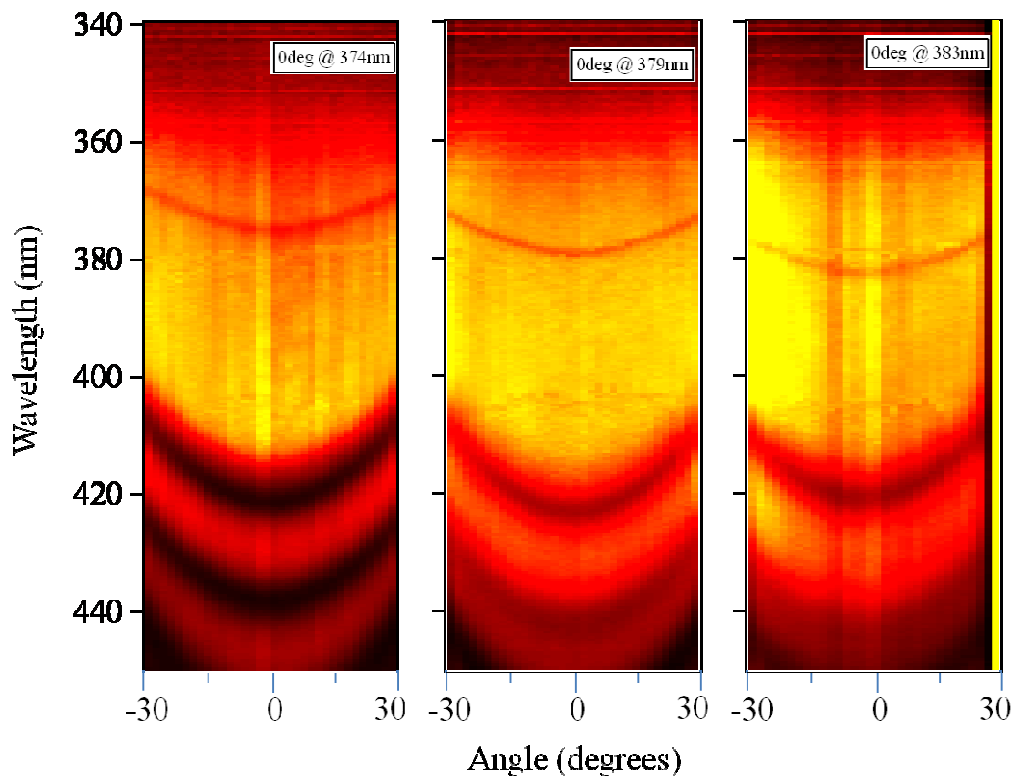


Fig. 1. Contour plots of angle resolved broadband reflectivity spectra acquired within a range of angle of 0° - 35° at several detunings.

We note that despite short length of the visit, due to limited funding available, we have been able to perform the first experiments and establish a very fruitful collaboration with Cambridge. Follow-up visits in both directions are already being scheduled. We expect that this new collaboration will lead us very soon to the first joint publication in this field in which contribution of ESF/POLATOM grant will be acknowledged.