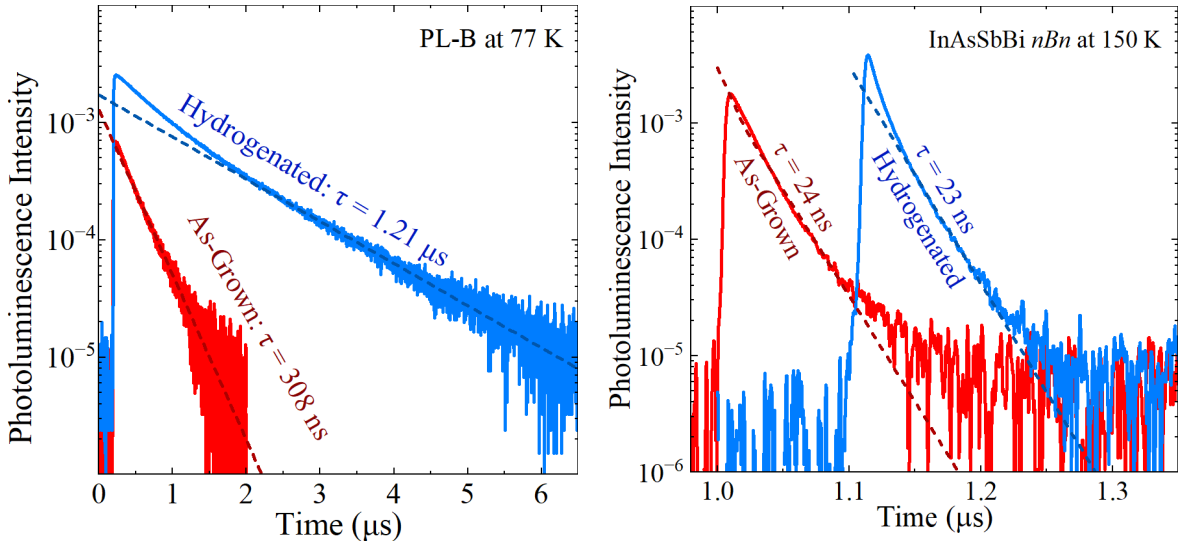

Fig. 1: Time-resolved photoluminescence for (a) InAsSb/InAsSbBi/InAsSb photoluminescence test structures at 77 K and (b) the InAsSbBi *nBn* photodetector at 150 K before (red) and after (blue) hydrogenation. No improvement in lifetime is observed in the *nBn*, as secondary ion mass spectrometry measurements show that the deuterium delivered through the hydrogenation process does not diffuse through the AlGaAsSb barrier.

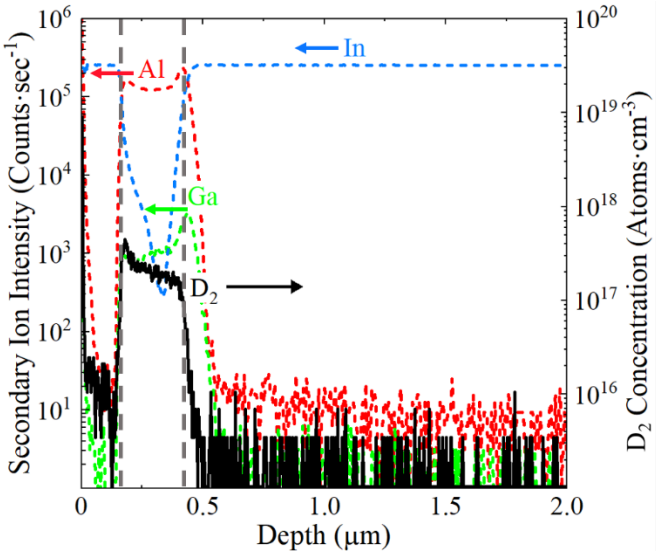

Fig.2: Secondary ion mass spectrometry showing the secondary ion yield of the alloy constituents Al, Ga, and In on the left-hand vertical axis (dotted curves), and the deuterium concentration (solid curve) on the right-hand vertical axis as a function of depth relative to the surface of the top contact layer of the hydrogenated *nBn* structure. *Vertical dashed grey lines indicate the upper and lower interfaces of the AlGaAsSb barrier layer. The signal suggesting In content in the AlGaAsSb and Al/Ga content below the AlGaAsSb result from sidewall milling during the measurement.*