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Impact of Growth Temperature and Post Growth Annealing on the Electrical Properties of InAs/InGaSb Superlattice Structures. ARTHUR SIWECKI, HENRY BOURASSA, MO AHOUJJA, SAID ELHAMRI, Department of Physics, University of Dayton, Dayton, Ohio, HEATHER HAUGAN, GAIL BROWN, SHIN MOU, WILLIAM MITCHEL, Air Force Research Laboratory, Materials Manufacturing Directorate, Wright-Patterson Air Force Base, Ohio — Infrared detector research has been the focus of several research groups worldwide. This intense interest arises from the many possible commercial applications of these devices. One of the important materials being investigated for such an application is the InAs/InGaSb superlattice structure. A key advantage of this material is that its detection wavelength can be tailored by varying the thicknesses of the layers constituting the superlattice structure. To fully exploit the full potential of the InAs/InGaSb superlattice structure in the area of infrared detection, it is paramount that its electrical behavior is fully understood. A key goal for all researchers in this area is a reduction in the background carrier density in these structures. It is well established that a high background carrier density degrades device performance. Growth conditions have a significant impact on the level of this density. In this study, we will report results of transport measurements conducted on several samples to evaluate the impact of sample growth temperature and post growth annealing on the carrier density and mobility of these superlattice structures.

Said Elhamri
Department of Physics, University of Dayton, Dayton, Ohio

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