Reg. no: MCS34-0171523001



Feb-28-2017, 08:23 PM (ET-US)

REGISTRATION / TIME STAMP (automatically applied upon uploading the document)

Mark C. Simpson February 28, 2015.

I think that a major application of the absorption at the InAs/GaSb interface described in Document-1 (uploaded on my personal priority account on February 24) is a new type of farinfrared photo-detector based on the optical absorption phenomenon disclosed above. The photodetector would comprises an InAs layer of thickness 20nm to 40nm disposed between two GaSb layers. The far-infrared photons incident on the InAs/GaSb heterostructure would be absorbed by electrons in the GaSb valence band thereby causing a transition of the electrons to the InAs conduction band.

The electrons transitioned in the InAs conduction band can move much easier into the InAs layer than in the GaSb layer because of the much higher mobility of the electrons in the InAs than the holes in the GaSb (at least 100 times higher mobility). Thus the surplus of electrons created in the InAs by the far-infrared photons increases the overall conductivity of the InAs/GaSb heterostructure which thereby can be translated into an increase of the current collected when a voltage is applied along the interface.

Thus a photo-detector can be made if contacts are grown at two ends of the InAs/GaSb interface.