

Abstract Submitted  
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**Surface origin of the LO phonon feature in the Raman spectrum of InN** ESTHER ALARCON-LLADO, NATE MILLER, MARIE MAYER, JOEL W. AGER — Wurtzite InN presents an intrinsic Fermi level pinning above the conduction band edge at the surface. For this reason, a large surface electron accumulation (SEA) occurs in InN. The interaction between the free electrons at the surface and the longitudinal optical (LO) phonon has been addressed by previous studies, but questions still remain. Here, we use the insulating nature of the Helmholtz layer that forms on a surface of an object in contact with an aqueous electrolyte to apply potentials to n-type (undoped) and p-type (Mg-doped) InN. Applying a potential to the electrolyte changes the electric field and distribution of free carriers near the surface. This enables us to perform electrolyte gated Raman spectroscopy on differently doped InN layers and while simultaneously modulating and probing the SEA region in InN. We find that the intensity of the forbidden LO Raman feature is changed by the external potential, showing that this feature is due, at least in part, to the SEA. This is the first experimental evidence of the relation between the LO feature in InN and free electron accumulation at its surface.

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