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**Anomalous Tunneling Characteristics of InGaAs/InAlAs Double-well Structures** Y. LIN[1], National Tsing Hua University, J. NITTA[2], NTT Basic Research Laboratories, A.K.M. NEWAZ, W. SONG, E.E. MENDEZ, SUNY at Stony Brook — We report tunneling phenomena in double quantum-well structures that are at odds with the conventional parallel-momentum-conserving picture of tunneling between two-dimensional systems. The thickness of the $In_{0.53}Ga_{0.47}As$ wells was the same in all the structures, 53Å and 82Å, but that of the three $In_{0.52}Al_{0.48}As$ barriers varied among the structures: either all 82Å, or all 100Å, or 100Å with 53Å in the middle. We have found that the tunneling current is mostly determined by the alignment between the emitter and a quantum state in the adjacent well, not by that between states in both wells. With magnetic fields parallel to the tunneling current, we have also found the field- dependent features before the peak voltage of the main resonance that correspond to tunneling channels into the Landau levels of the well near the emitter. These results provide evidence of the violation of in-plane momentum conservation in two-dimensional systems.

[1]NTT Basic Research Laboratories
[2]CREST-JST

Junsaku Nitta
NTT Basic Research Laboratories

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