

Abstract Submitted  
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**Ground states of a novel AIAs quantum wire** TRINANJAN DATTA,  
ERICA W. CARLSON, Department of Physics, Purdue University — Using abelian bosonization and renormalization group, we analyze the ground states of a recently fabricated novel AIAs quantum wire [Moser et al, Appl. Phys. Lett. (2005)]. There are two degenerate lowest energy bands, separated by half an unklapp vector. This bandstructure arrangement leads to four Fermi points and umklapp-induced pair processes, independent of filling. The ground states are different from those of a conventional quantum wire, where acquiring four Fermi points requires occupying two successive bands, leading to a CDW instability via density reorganization. Such an instability is forbidden in the AIAs wire, which may help stabilize other exotic gapped ground states.

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