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Localized interface state in coherent covalent semiconductor heterojunction

[1,2,*] [3,†]

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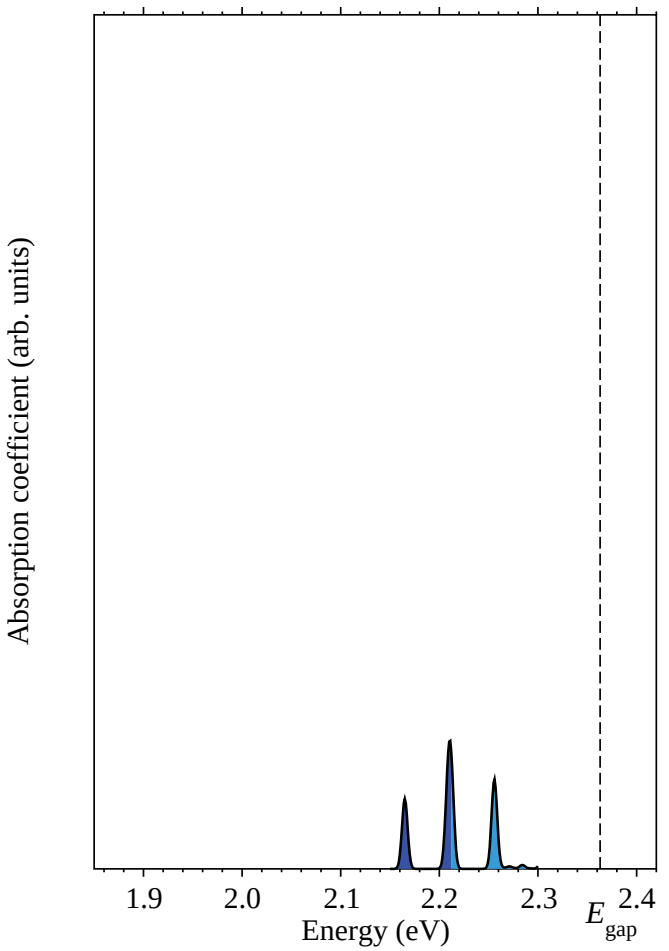
[illegible]


Absorption coefficient (arb. units)
1.9
2.0
2.1
2.2
2.3
2.4
Energy (eV)
E_{gap}

( ) (n,m) ( )
$n+m$; n m
, . $n+m$
, X_z

B. Compu ing he QW eigen a e

T

-

$$\left[-\frac{\beta}{2}\nabla^2+\sum_{n,\alpha}\widehat{v}_\alpha(\vec{r}-\vec{R}_{n\alpha},\underline{\varepsilon_n})+\widehat{V}_\alpha\right]|\,i\rangle=E_i|\,i\rangle, \quad (3)$$

$v_\alpha(\vec{r}-\vec{R}_{n\alpha},\underline{\varepsilon_n})$

α

$\underline{\varepsilon}$ $\vec{R}_{n\alpha}$:

$$v_\alpha(\vec{r},\underline{\varepsilon})=v_\alpha(\vec{r},0)\;1+\gamma_\alpha \mathrm{T}\;(\underline{\varepsilon})\;, \quad (4)$$

γ_α

.[18] T

. (3) - $\widehat{V}_\alpha$

, β, .[18]

T $v_\alpha(\vec{r},0)$

$v_\alpha(\vec{r},0)$

(A) -

(, X, L)

. -

,

,

, , , ,

. , -

$A_xB_{1-x}C$

AB/AC . A

A .

α

$\vec{R}_{n\alpha}$, -

(3) -[19]

M B ,

.[20]

C. La ice relaxa ion by rain minimiza ion

. A

,

-

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A. Model of interface state in a single heterojunction

1930 , T [26] [27] S -

, ,

. T

.

, ,

J [28]

,

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T

T ,[29]

J .[28] , T

,

A B. I

. ( ) - , , CB

S A B B,

- - V ;[7,8] ( ) (

) , ,

, ( ),

, X. T

, A /A A /

S .[29] S

B. Appearance of a single interface state at the InP/GaP junction

T

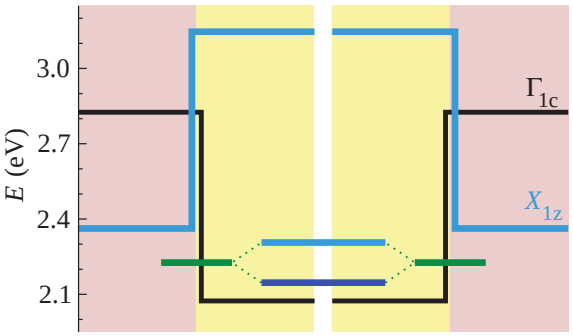
/ / (001)

. , ( )$_n$/( )$_m$ S $n = m =$

80 . S n m ( )

/ ( ) -

(001)- - - . S ,


3.0
2.7
2.4
2.1
E (eV)
Γ1c
X1z

$e_s(\ )$

. 5( ) $n = 7$. T

n $e_s(\ )$

S ' . , ,

- - - (TB) , . 5( ). T (

0.75 V) , , . T

TB ,

$n = 1$,

$n = 10$. C

- $e_s(\ )$

$n \geqslant 8$. , -

, $n \leqslant 7$

n

(S .) :

$\vec{k} = (0,0,k_z)$

. (7)

, n ,

2

n. , 1

n ,

e_s(

TAB . A , , . (. .)^3, ; (A2) (A3). A - 5 . A γ . (4). ; , 5.1346 −09 5.1346 × 10^{-9}.

	a_{SO}	γ	a	b	c