mehdy@bohlool.com

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MEMS .[1][2]

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.[3]

.[13]

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[3] Micro Electronic Mechanical Systems
[4] Etching

: John von Neumann

Stanislaw Ulam .[4][5]

$\{\Sigma, d, V, \phi\}$ d V ϕ

Σ $k = |\Sigma|$

$k=2$ $\Sigma = \{0,1\}$ 2r+1

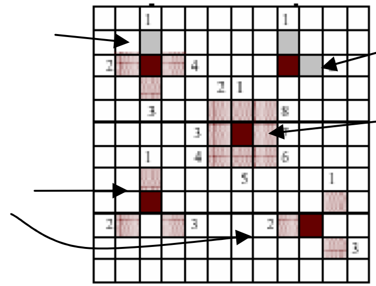
$$\phi = \Sigma^{2i+1} \rightarrow \Sigma \qquad (\ )$$

ϕ

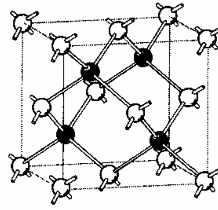
.r=1

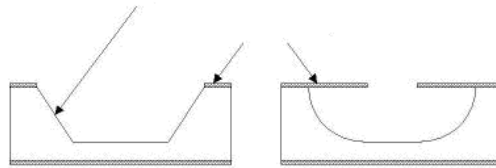
: [6]

.[7]



[1] Line by Line sweep

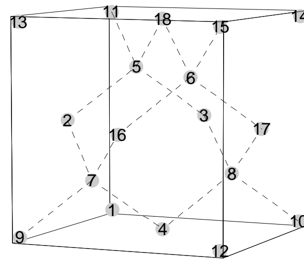




.[9]

[1] Isotropic
[2] Anisotropic

[10-12]



0,0,0	
1/2,0,1/2	
0,1/2,1/2	
1/2,1/2,0	
1/4,1/4,3/4	
3/4,3/4,3/4	
3/4,1/4,1/4	
1/4,3/4,1/4	

0,0,0	
1,0,0	
-1,0,0	
0,1,0	
0,-1,0	
0,0,1	
0,0,-1	
-1,-1,-1	
1,1,1	

[1] Unit Cell
[2] Net Atom

IKT 2005
کنفرانس بین المللی
فناوری اطلاعات و دانش

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{2,2,2,2,2,2,2,2}

{2,1,1,2,0,2,2,2} . .

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Si {110}

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Si {100} .

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Si {111} .

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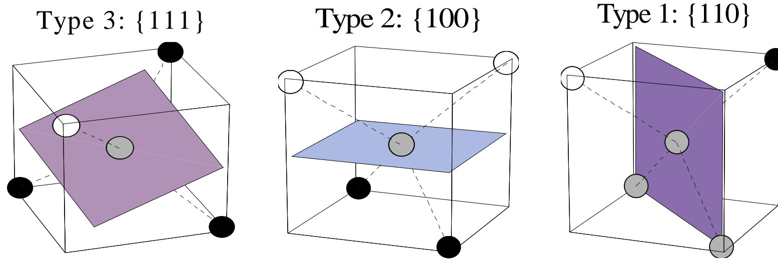

(

KOH

. $R_{110}:R_{100}:R_{111}$ 50:30:1

160:100:1 .

. :

$$P_{hkl} = R_{khtl} / (R_{110} + R_{100} + R_{111}) \quad (\ )$$

hkl .

:

Si RND $(0<RND<1)$ $[0,P_{100}]$.

Si RND $[0,P_{110}]$.

Si RND $[0,P_{111}]$.

Si .

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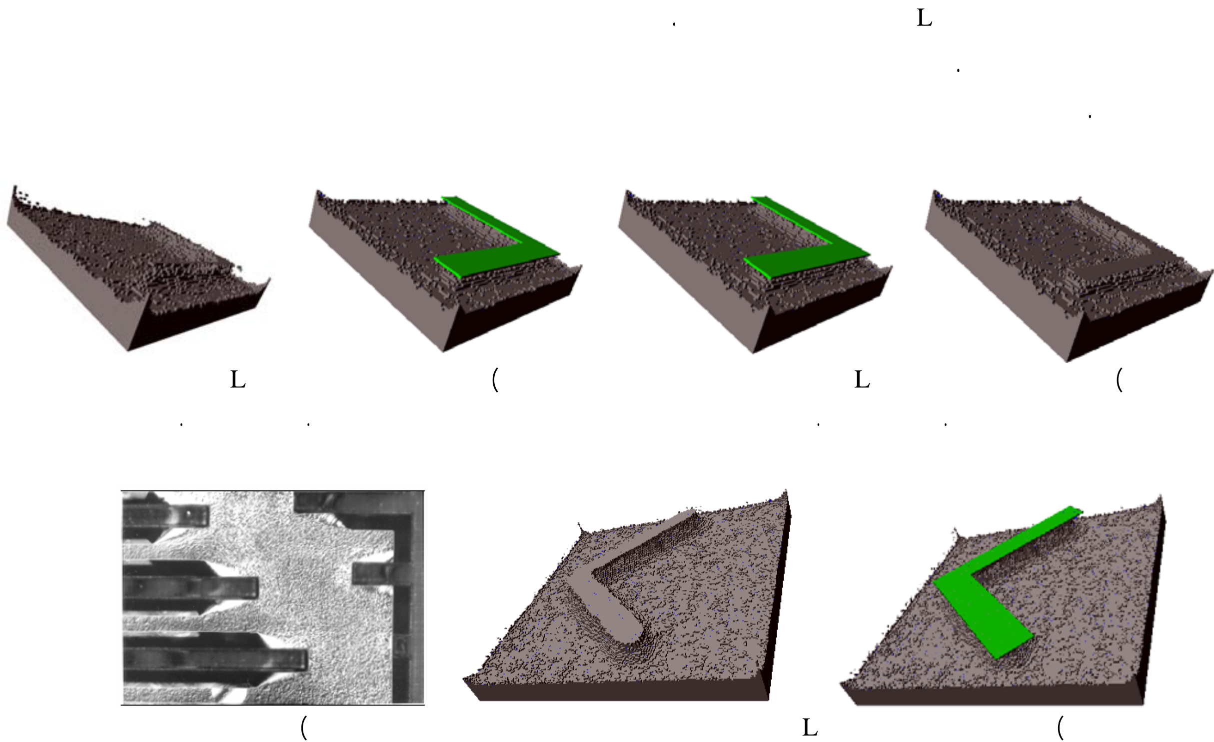

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{110} .

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SEM [14] .

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.[14] .

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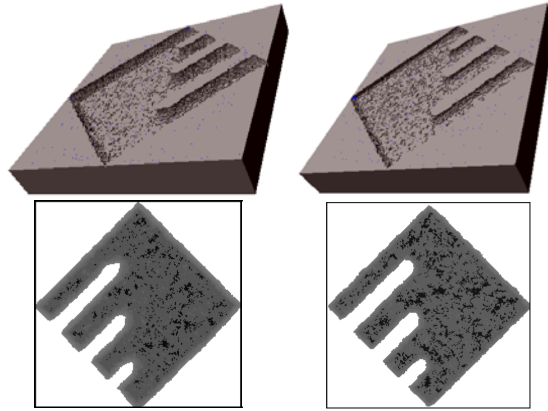
[1] Under-Cutting



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[9] .

SEM .

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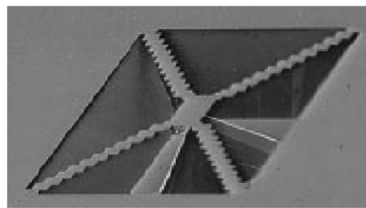
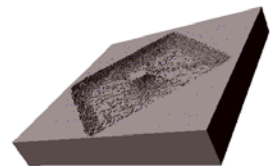
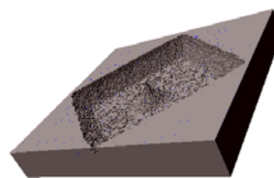
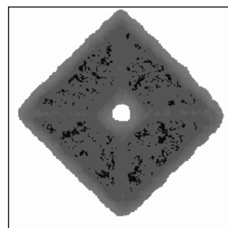
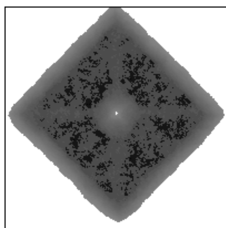


) SEM

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