

## Discussion on Exam paper

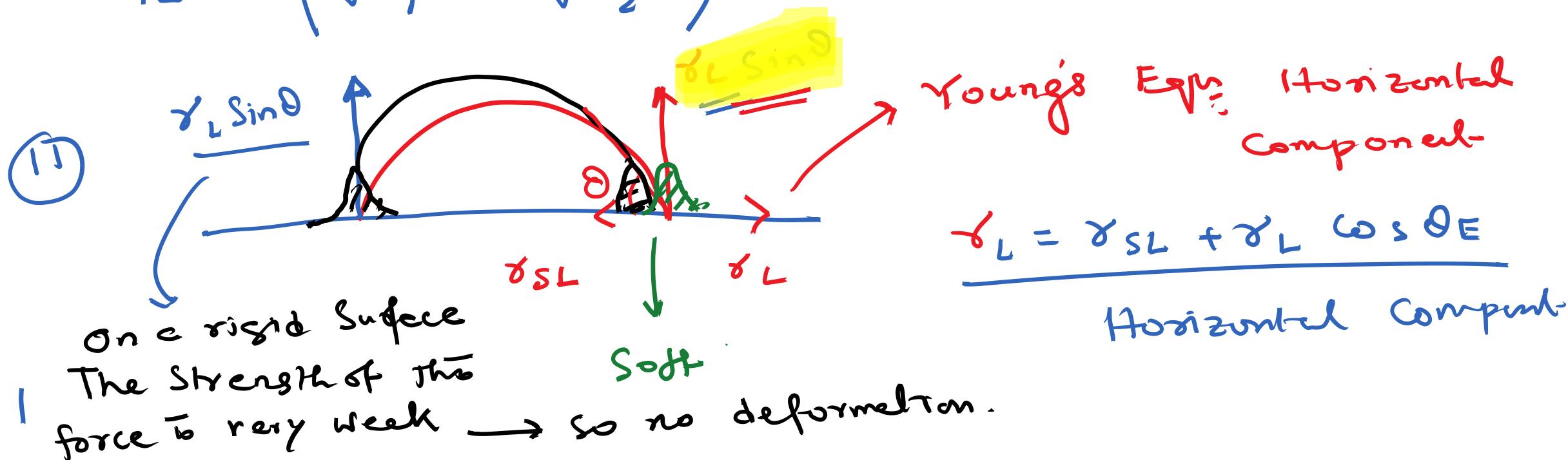
7th March 2022

Instability Lect 22

③ Wenzel State  $\cos \theta^* = \gamma_f \cdot \cos \theta_E$

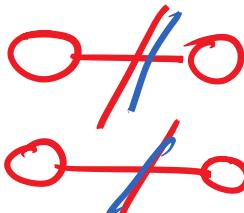
$$\theta_E < 90^\circ, \quad \underline{\theta^* < \theta_E} \rightarrow \text{As } \frac{\gamma_f > 1}{\text{Always}}$$

⑦  $\gamma_{12}^{LN} = (\sqrt{\gamma_1 \omega} - \sqrt{\gamma_2 \omega})^2$



Q13: Stronger intermolecular interaction  $\rightarrow$  Reduced Evaporation

Higher Critical Temp also

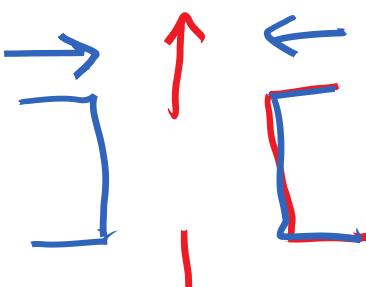


Separate molecules and Create new surface  
NEED more energy.

( $\gamma_s \uparrow$ )

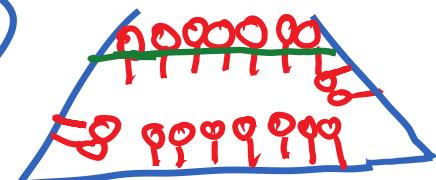
You need to Supply more Energy to overcome all interacting  
 $\rightarrow T_B$  is also higher

(Stronger interaction  $\rightarrow$  Lower Vap Pr  $\rightarrow$  Higher  $\gamma$ )



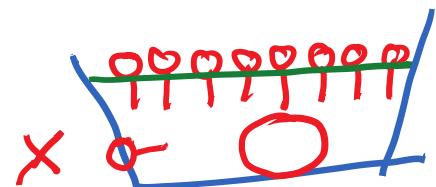
Flow (Hydrophobic repulsion)

Delayed  
micelle  
formation



Perspex  
(Polymer - Hydrophobic)

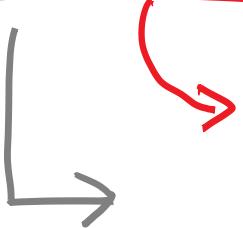
$\rightarrow$  Higher  $T_B$ )



Glass

16

## Internal potential Energy of an a polar material


 $I.D - I.D \text{ vdw interaction} = -\frac{A}{r^6}$

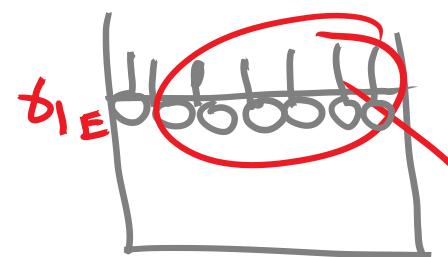
$$\neq f(T)$$

Not depend on Temp.

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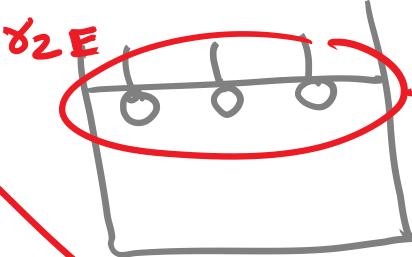
## Soap Bubble:-

Surface  
Fully covered

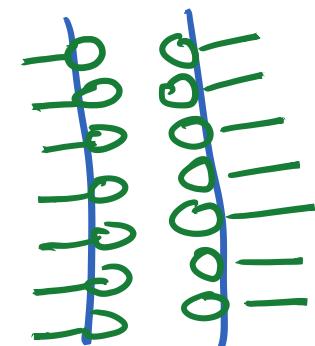


More Surface  
added

Surface  
NOT fully  
covered

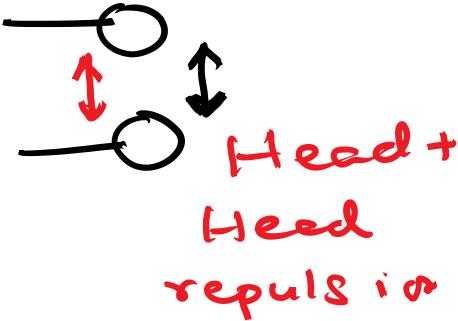
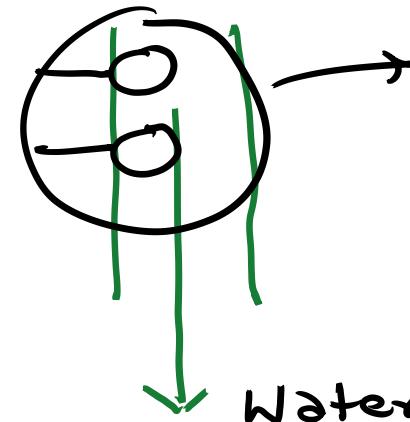


$\gamma_{2E}$



Effective  $\gamma$   
Less Surface  
molecules

Effective  $\gamma \rightarrow ?$   $\gamma_{1E} < \gamma_{2E}$

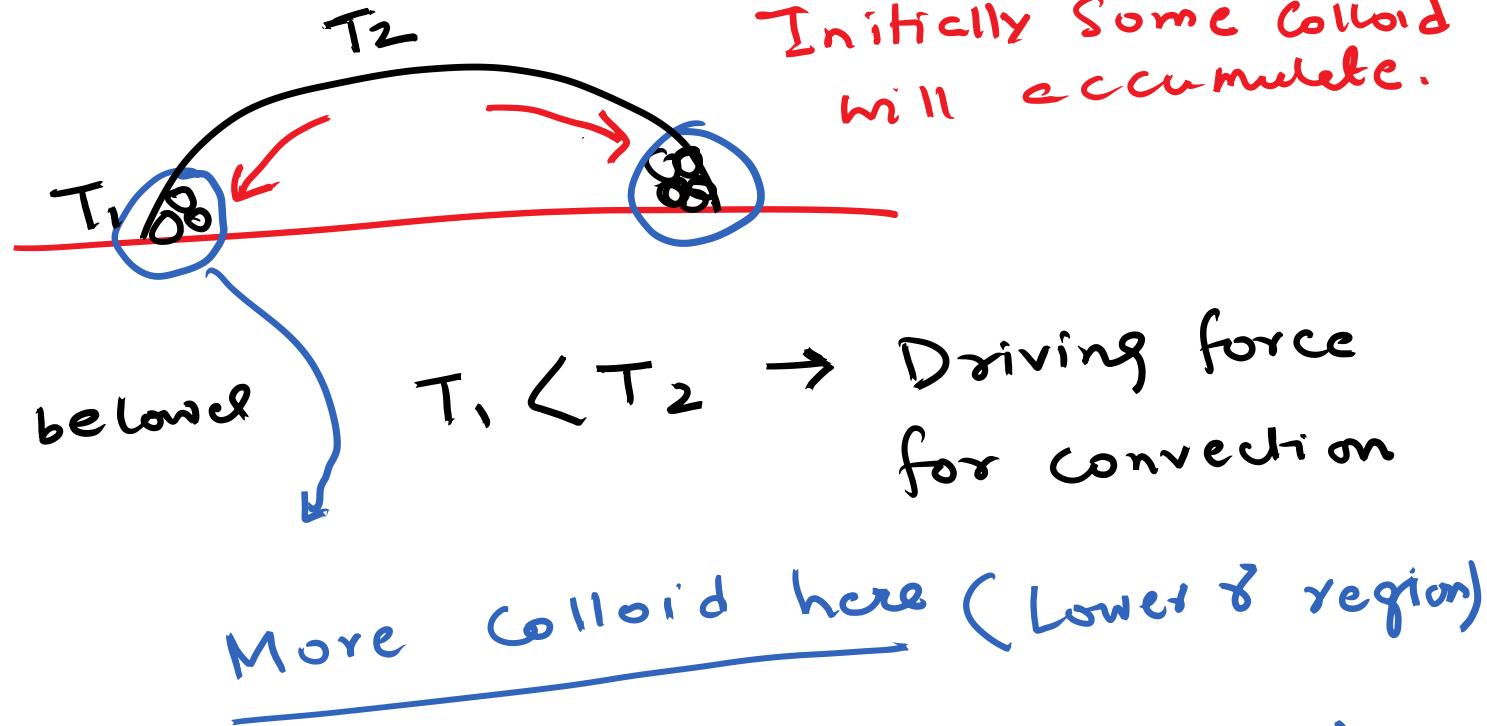


Water will try to  
drain.

## 18. Colloidal Drop.

Rate of Evap is  
Higher at the  
periphery  $\rightarrow$

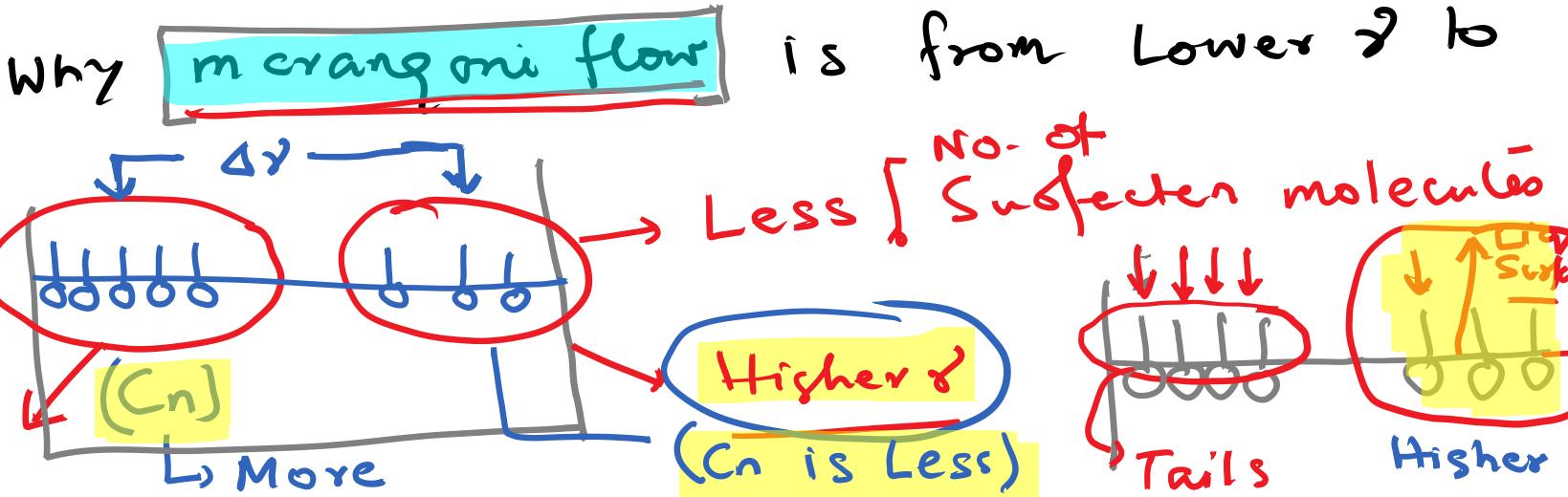
Temp at Periphery will be lower



$\Delta\gamma \rightarrow$  (Lower  $\delta$  at the periphery) - (Higher at Center)

↳ How to justify why microangi flow is from Lower  $\delta$  to higher  $\delta$ .

More no. of Surfact. molecules  
Lower  $\delta$



# Discussion on Exam 1.

09.03.2022

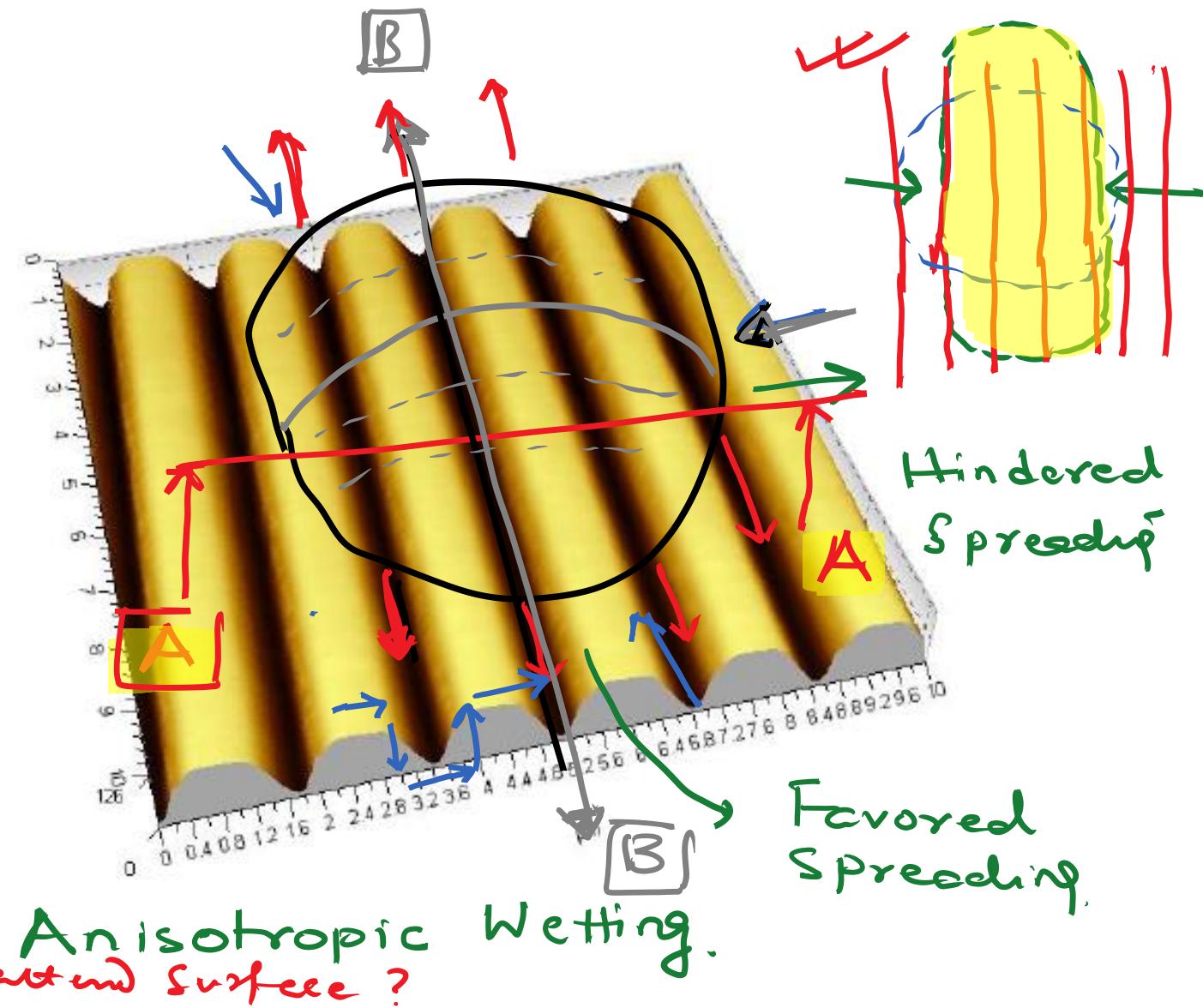
Shape of a liquid drop on a Grating.

Patterned Substrate.

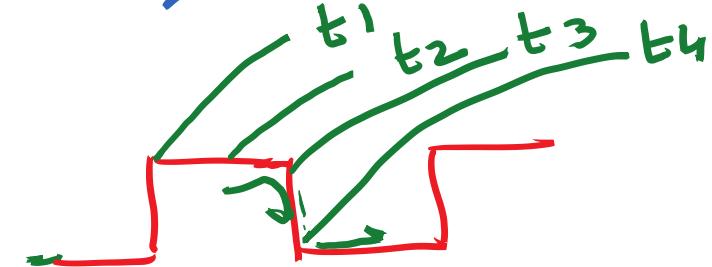
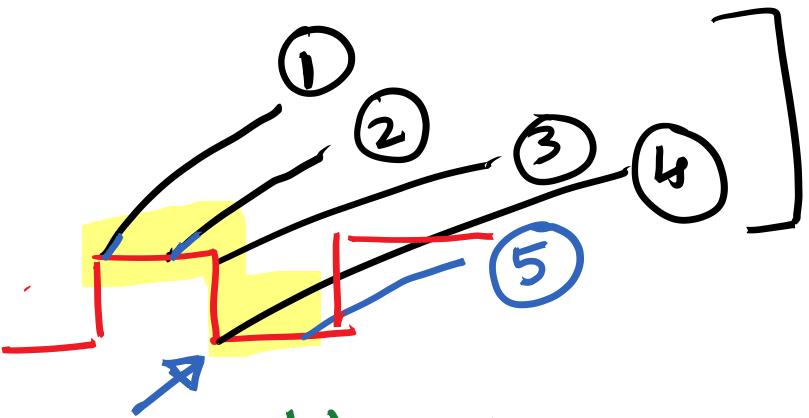
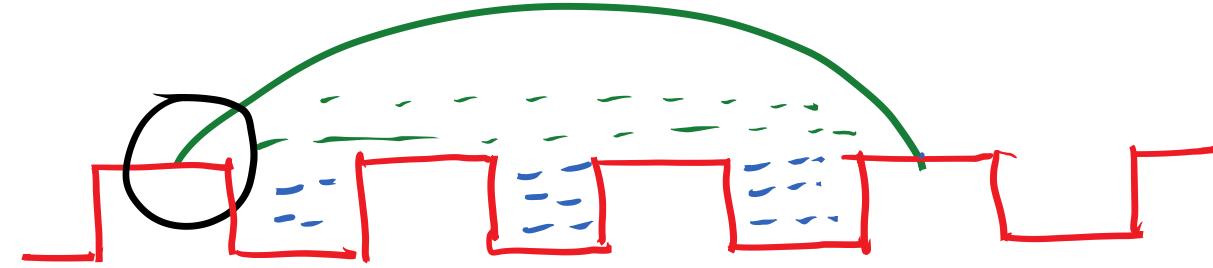


Can this represent a drop on a patterned surface?

Lecture 23



## Wenzel State

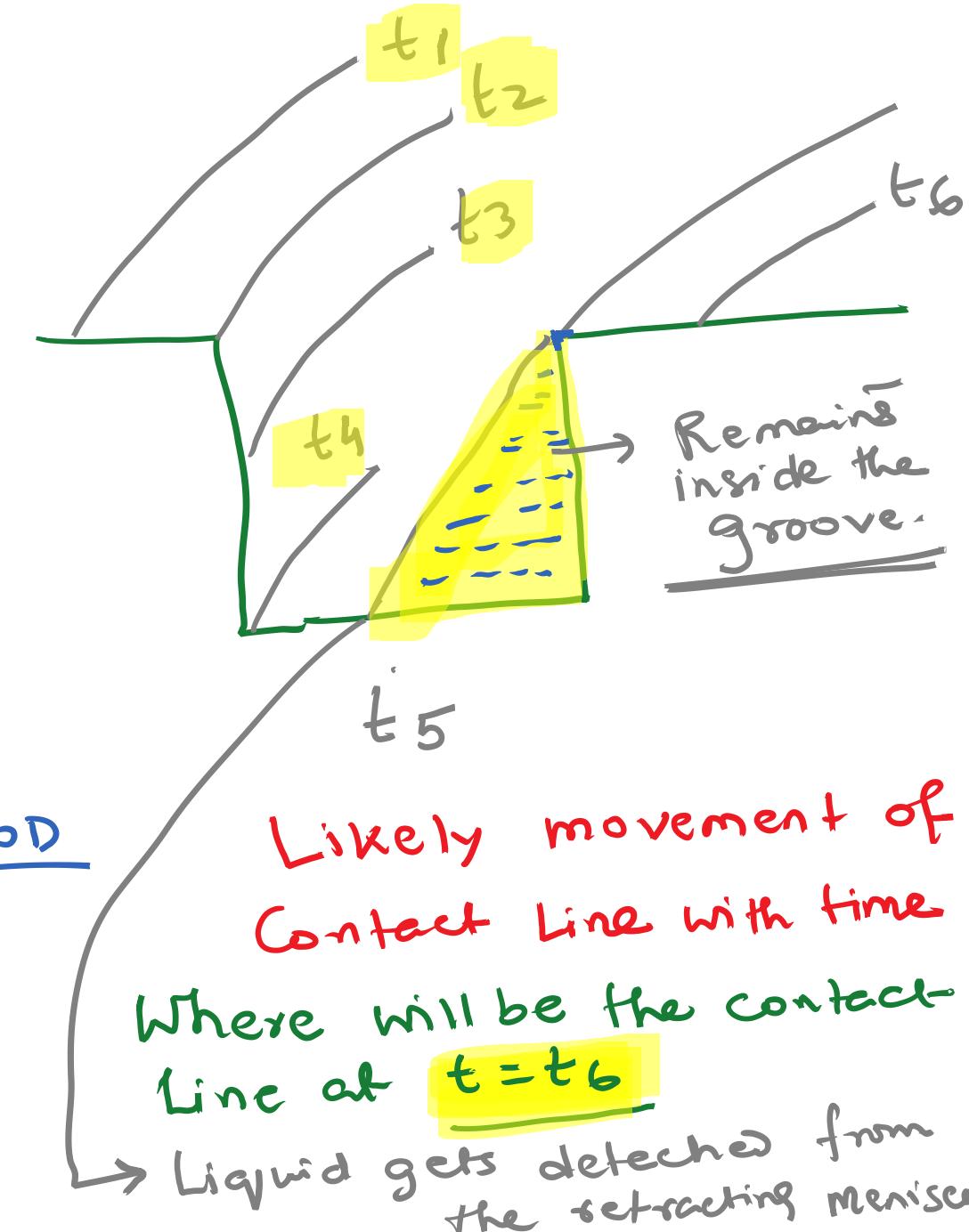


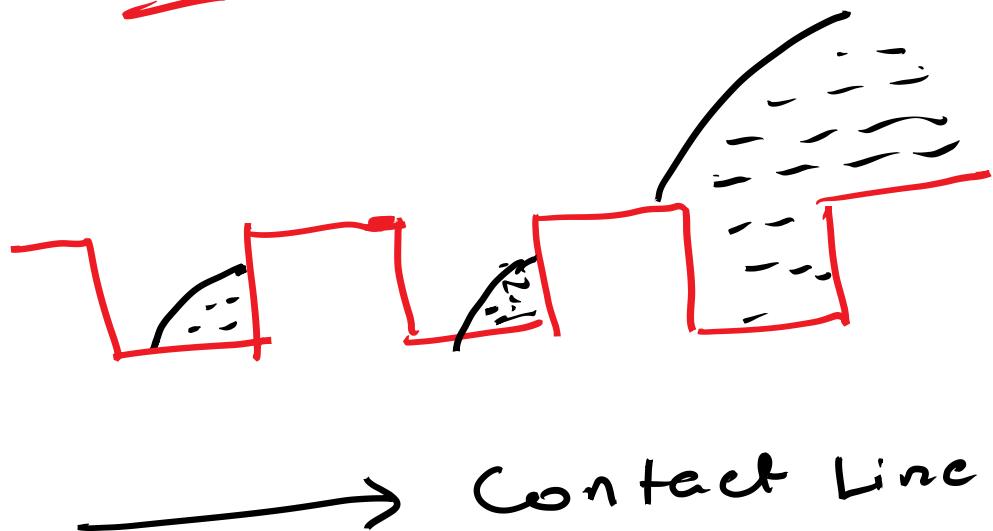
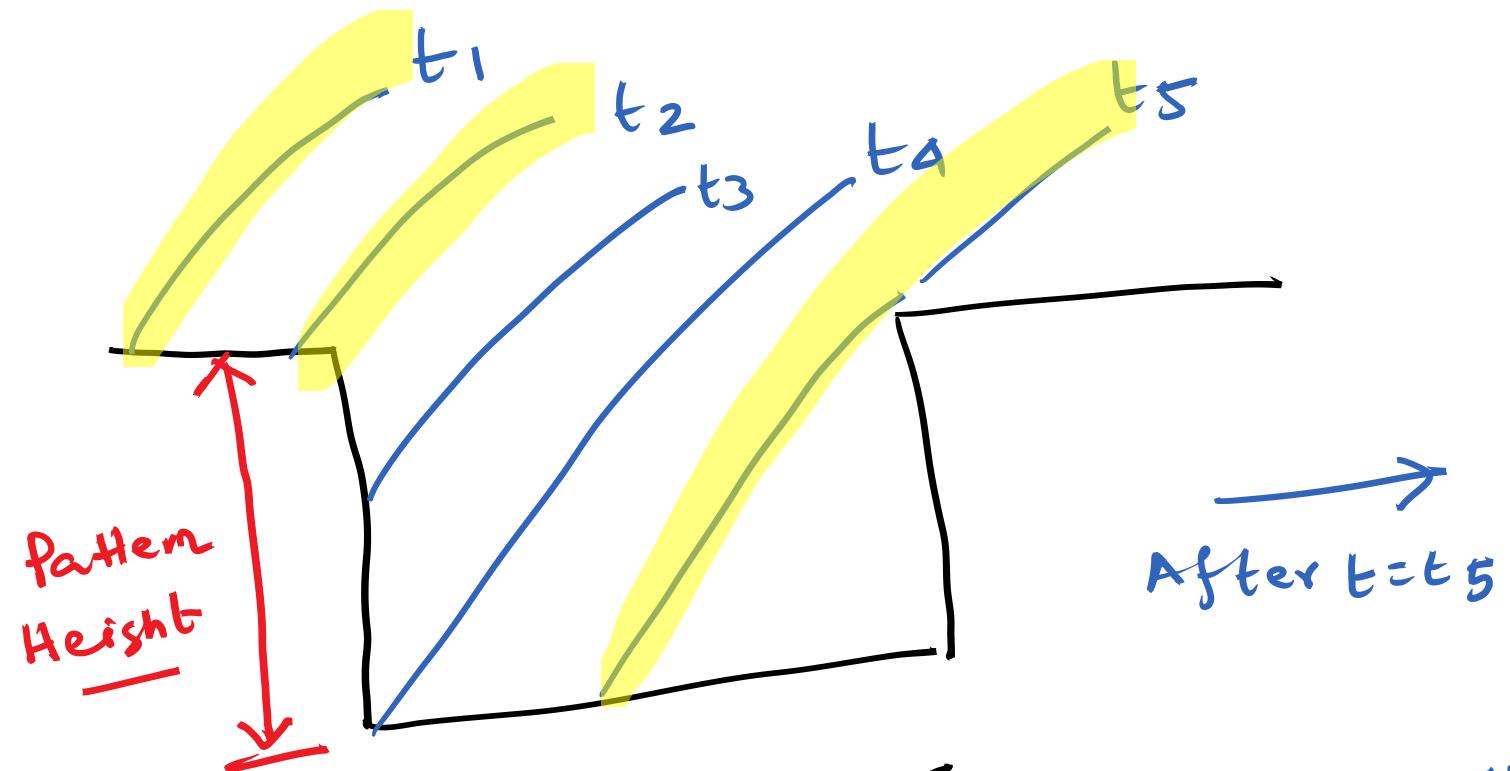
What happens when the Contact Line is retracting

Figure 1S  
Gross !!

Where exactly the Contact line Lie?

NOT WELL UNDERSTOOD

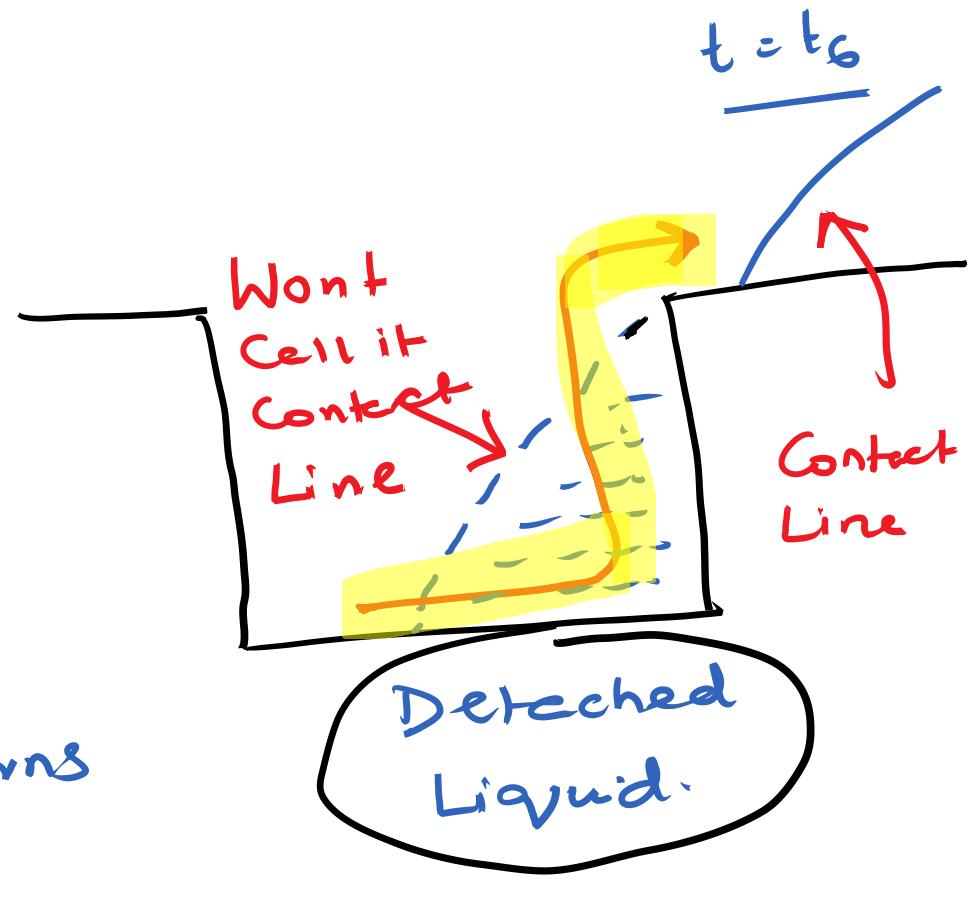




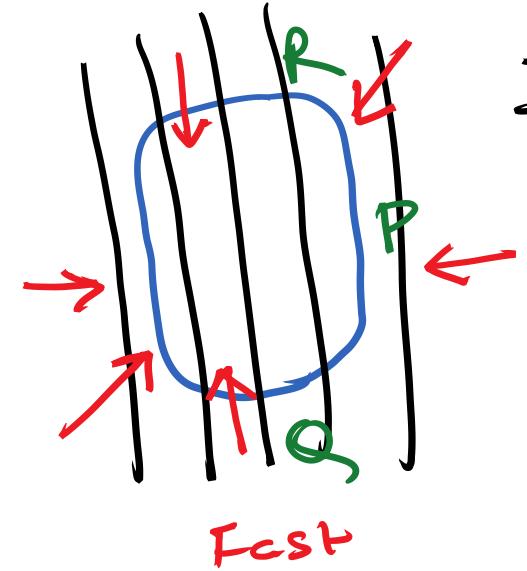
Contact Line  
has retracted

The patterns  
acts as  
"Hurdles"

The  
retracting  
velocity along  
the minor axis is **SLOW!**



**=**

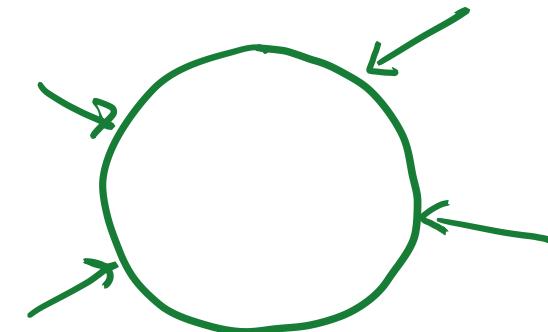


Retraction  
velocity is  
direction  
dependent!

In refraction along major axis, there is  
no Hurdle

Along minor axis  $\rightarrow$  Hurdle

Slowest at  
Then  
Then



On a Flat Surface

