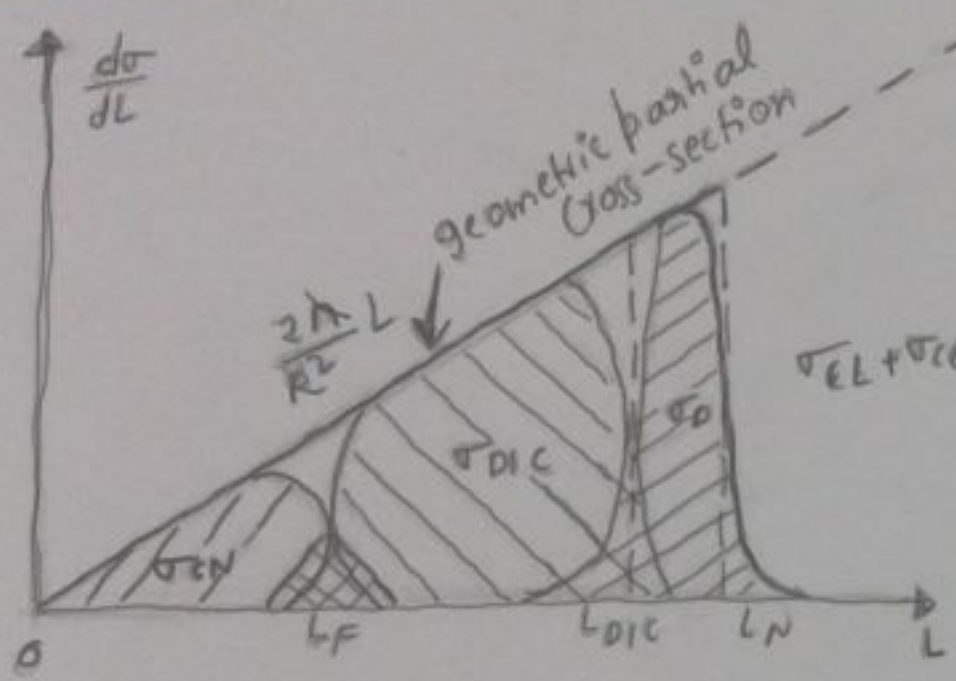
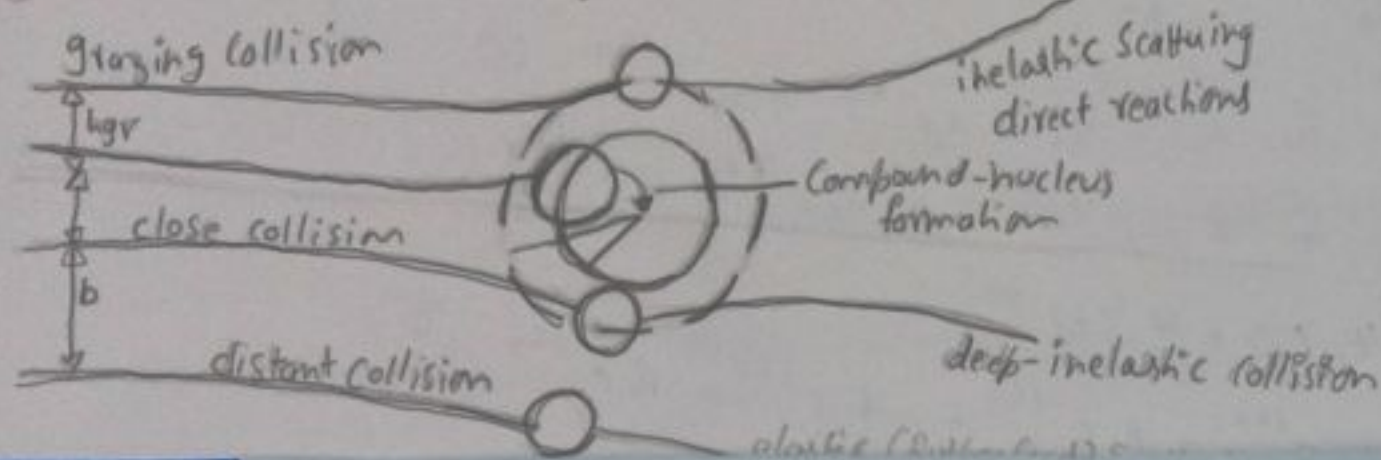


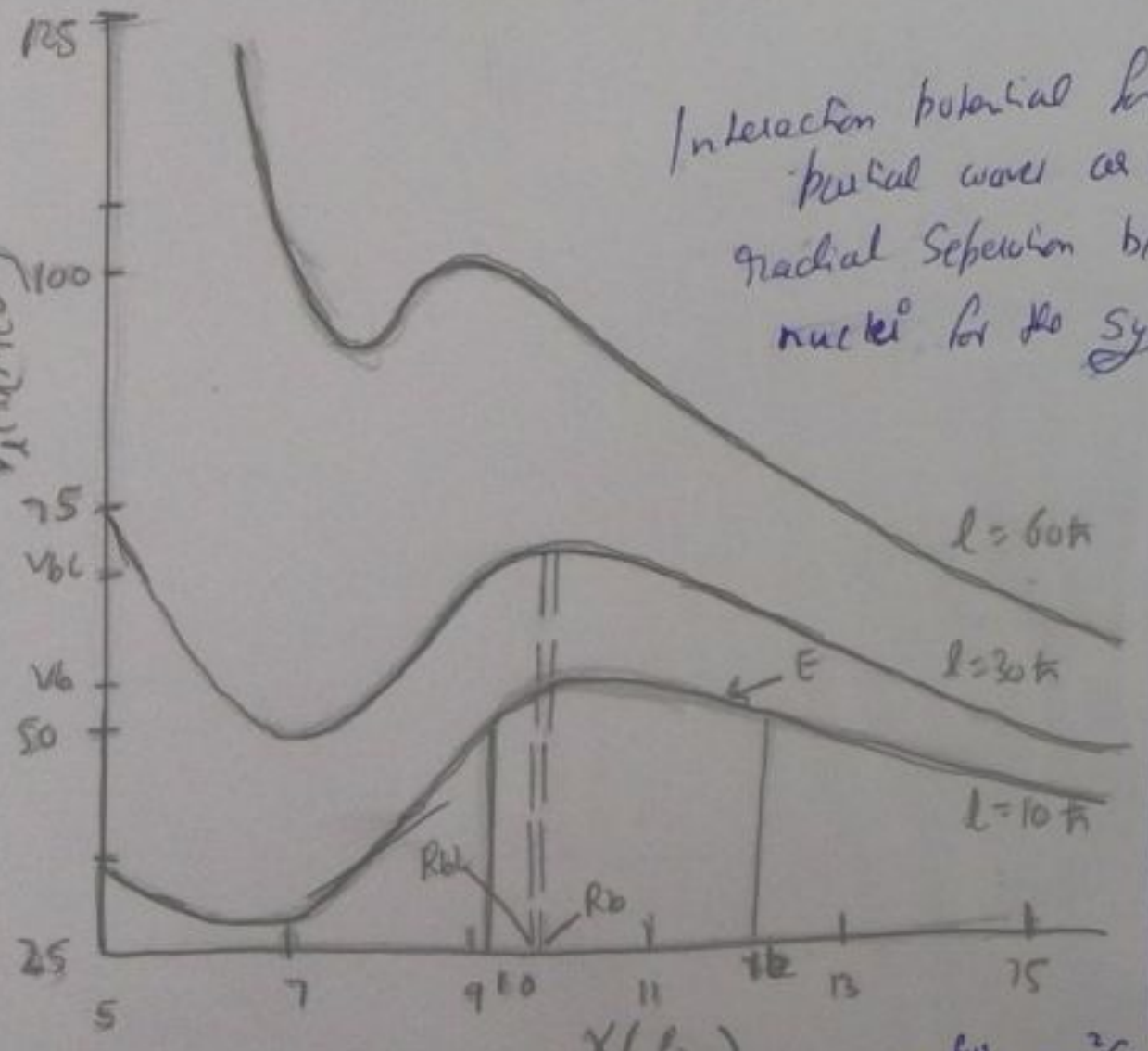
# Dynamics of Nuclear Fusion and Fission Processes:

## A Discussion Meeting

### Classical Picture of heavy ion-reaction



The  $l$  dependence of the potential cross-section for compound nucleus formation (CN), deep inelastic collision (DIC), direct reaction (DR), Coulomb interaction (CI) and elastic (EL) processes.



Partial fusion cross-section for complete cross-section

$$\sigma_{fus} = n \lambda^2 (2l+1) \times \left( T_0(E) P_0(E) \right)$$

$$\sigma_{fus}(E) = \sum_{l=0}^{\infty} \sigma_l^{fus}(E)$$

$$\bar{\sigma}_{fus} = \frac{\sum_{l=0}^{\infty} \sigma_l^{fus}}{\sum_{l=0}^{\infty} \sigma_l^{fus}}$$

$E \uparrow / T$

$0.125$   
 $1.75$   
 $3.25$

$t' (\text{fm}^2)$

$a(\omega) = \tilde{a} \left( 1 + \frac{\beta \omega}{v} \right)$

$\frac{\partial \rho(x,t)}{\partial t} = -\frac{\partial}{\partial x} [\mu(x,t) \rho(x,t)] + \frac{\partial^2}{\partial x^2} [D(x,t) \rho(x,t)]$

$T_0(E) = \left( 1 - \frac{2R_0(E)}{2R_0(E)} \right)$  with  $\Gamma_{fiss}$

$\Gamma_{fiss}(t) = \Gamma_{fiss}^{BW} (\sqrt{1+v^2}-1) \left[ 1 - \exp\left(-\frac{2.5t}{\tau_f}\right) \right]$

$m \frac{d^2 x}{dt^2} = -\lambda \frac{dx}{dt} + \eta(t)$

$V_l(r_0) = V_l(r_b) = E$ , and  $R_0$  minimal

$\Rightarrow \sigma_{fus} = \frac{n \lambda^2 (2l+1)}{(1 + \exp\{2K_0(E)\})}$

$E \bar{\sigma} = \sum_{l=0}^{\infty} l \sigma_l^{fus}$

- Fusion-Fission
- Fusion Evaporation
- Nuclear level Density
- Nuclear Viscosity
- Thermal Fluctuations
- Fast Fission
- Quasi Fission