

Top View

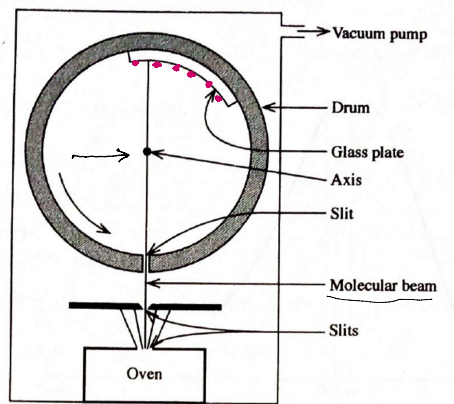
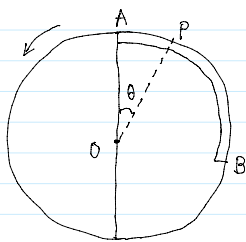


Fig. 7.5 : The Zartman - Ko experiment

Molecular Beam  
(Bismuth)Oven Temp ( $800^{\circ}\text{C}$ )

Speed of rotation

600 rpm



Suppose we want to find the velocity of particles striking at point P.

If  $f$  is the Frequency of rotation

then  $\frac{1}{f}$  is the time period.

i.e time taken to complete  $360^{\circ}$ .

$\therefore$  Time taken to rotate through  $\theta$  angle will be

$$t = \frac{\theta}{360} \cdot \frac{1}{f}$$

$\therefore$  Distance travelled by molecules depositing at P' during this time is D. the diameter of cross-section of the drum

$$c = \frac{D}{t}$$

$$= \frac{D}{\theta} \cdot 360 f$$

$$\therefore c = (360 D f) \cdot \frac{1}{\theta}$$

The experiment is carried on For some time. Then the relative concentration of bismuth vapour deposited on the plate at different parts are studied. This concentration is proportional to the number of molecules reaching to the plate, this analysis is in accordance with MB distribution law.