Somaiya Vidyavihar University
K. J. Somaiya College of Engineering, Mumbai -77
(A Constituent College of Somaiya Vidyavihar University)

Department of Science and Humanities

F Y B Tech SEM I 2021-22
Engineering Physics Lab Course

Numerical Aperture

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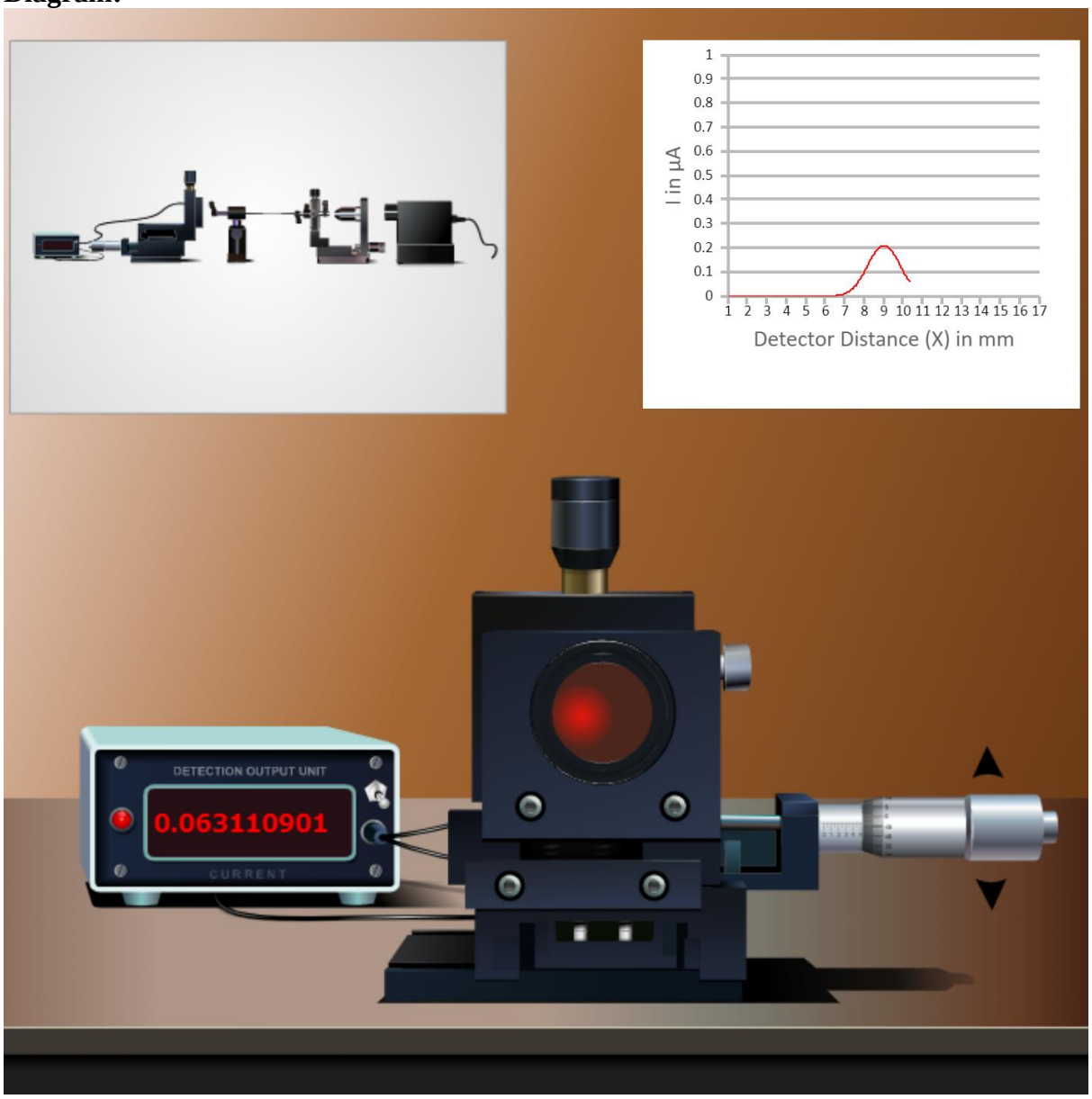
Aim: To find the numerical aperture of a given optic fibre and hence to find its acceptance angle.

Apparatus: Emitter, concentrator, fiber, fiber stand, detector, output unit

Diagram:



Observation Table:

Obs. No.	d(mm)	I_{max}(µA)	$\frac{I_{max}}{2.71}$(µA)	2r (mm) $= (x_{max} - x_{min})$	r (mm)	NA
1	2mm	0.3694	0.1363	1.4mm	0.7mm	76.94
2	3mm	0.2457	0.0906	2.0mm	1.0mm	18.42
3	4mm	0.1847	0.0681	2.8mm	1.4mm	19.32
4	5mm	0.1477	0.0545	3.4mm	1.7mm	18.78
5	6mm	0.1231	0.0454	3.1mm	1.55mm	14.47
6	7mm	0.1055	0.0389	5.2mm	4.6mm	33.30

Formula:

Numerical Aperture (NA) = $\frac{r}{\sqrt{r^2+d^2}}$

Acceptance angle (i) = Sin^{-1} (NA) =

Home Assignment:

- Determine Numerical Aperture and Acceptance angle

The "Numerical Aperture" (NA) is the most important number associated with the light gathering ability of an objective or condenser. It is directly related to the angle of the cone which is formed between a point on the specimen and the front lens of the objective or condenser, determined by the equation NA = n sin ∝.