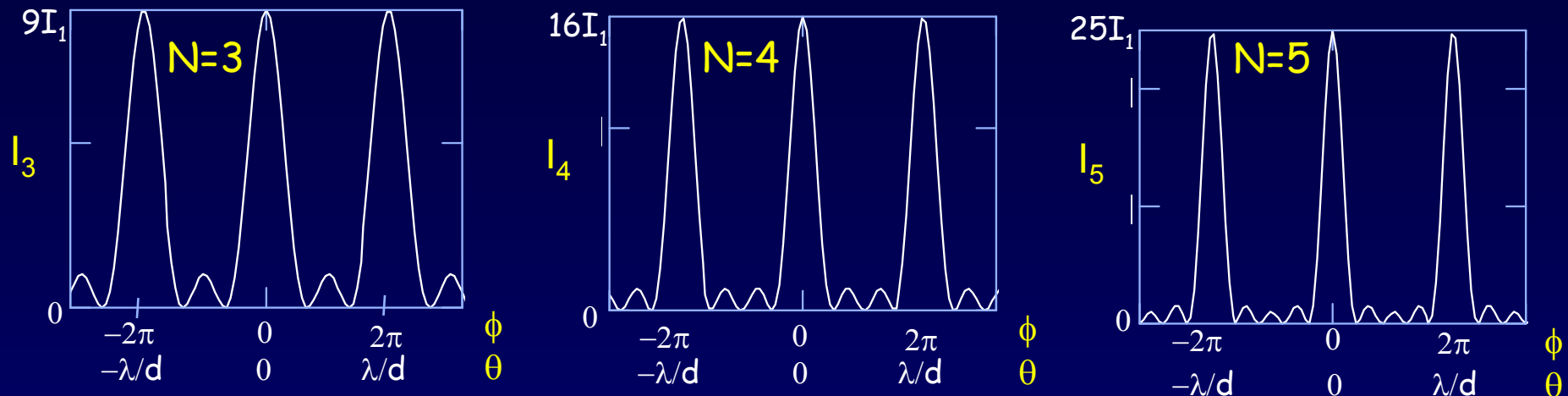


Multiple Slit Interference



The positions of the principal maxima occur at $\phi = 0, \pm 2\pi, \pm 4\pi, \dots$
 where ϕ is the phase between adjacent slits. $\theta = 0, \pm \lambda/d, \pm 2\lambda/d, \dots$

The intensity at the peak of a principal maximum goes as N^2 .

3 slits: $A_{\text{tot}} = 3A_1 \Rightarrow I_{\text{tot}} = 9I_1$. N slits: $I_N = N^2I_1$.

Between two principal maxima there are $N-1$ zeros and $N-2$ secondary maxima \Rightarrow The peak width $\propto 1/N$.

The total power in a principal maximum is proportional to $N^2(1/N) = N$.